(25,458)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1916.

No. 628.

JIM BUTLER TONOPAH MINING COMPANY, PLAINTIFF IN ERROR,

vs.

WEST END CONSOLIDATED MINING COMPANY.

IN ERROR TO THE SUPREME COURT OF THE STATE OF NEVADA.

25

INDEX.

	Original.	Print
Caption	*a*	1
Transcript of record from the District Court of Nye County	*b*	1
Bill of exceptions and record on appeal	*b*	1
Stipulation as to proceedings, &c	*c*	1
Colloquy between court and counsel	2	4
Testimony of George W. Pierce	7	7
Warren V. Richardson	9	8
Walter H. Wiley	54	34
Edmund Jussen	173	99
John W. Chandler	213	122
Robert Christian	310	178
H. R. Bradley	314	181
Exhibit K—Statement, daily assay report, December 4, 1914	331	191
Testimony of Ben. I. Hoxey	345	200
Horace V. Winchell	376	218
E. A. Byler	492	280
O. McCraney	493	280
E. C. Uren	494	281

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., NOVEMBER 29, 1916.

	Original.	Print
Reporter's certificate	510b	201
Judge's certificate	510c	202
Clerk's certificate	510d	202
Testimony of John W. Finch	511	203
J. M. Fox	723	410
Fred J. Siebert	738	420
Frederick Bradshaw	837	474
Clyde Jackson	841	476
James W. Cusick	851	483
Fred Searls, Jr.	856	486
Andrew C. Lawson	992	559
Fred Searls, Jr. (recalled)	1076	602
Walter H. Wiley (recalled)	1089	609
Horace V. Winchell (recalled)	1110	620
Reporter's certificate	1132	631
Judge's certificate	1133	631
Clerk's certificate	1134	632
Opinion	1137	632
Diagram	1144	636
Findings of fact requested by plaintiff (omitted in printing)	1160	
Order as to findings of fact....(omitted in printing)..	1163	
Findings of fact and conclusions of law	1164	644
Stipulation as to proceedings, &c.	1165	645
Findings of fact	1168	647
Conclusions of law	1176	652
Plaintiff's objections and exceptions to findings, &c. ....(omitted in printing)..	1179	
Judgment roll	1183	653
Complaint	1184	653
Answer	1191	657
Replication	1201	664
Amended complaint	1209	668
Stipulation as to proceedings, &c.	1217	672
Findings of fact and conclusions of law	1221	675
Stipulation as to proceedings, &c.	1222	675
Findings of fact	1225	678
Conclusions of law	1233	683
Judgment	1235	684
Clerk's certificate to judgment roll	1237	685
Notice of intention to move for new trial (omitted in printing)	1240	
Motion for a new trial.....(omitted in printing)..	1248	
Notice of motion for new trial (" ")..	1250	
Notice of intention to move for a new trial (omitted in printing)	1252	
Motion for a new trial.....(omitted in printing)..	30	
Ruling on motion for new trial (" ")..	1263	
Order denying motion for new trial (omitted in printing)	1265	

	Original.	Print
Memorandum of errors relied on by plaintiff upon motion for new trial.....(omitted in printing)..	1267	
Request for modification of findings of fact (omitted in printing)	1276	
Application and affidavit for temporary restraining order, &c. .....(omitted in printing)..	1279	
Affidavit of W. J. Pike in support of application for restraining order, &c. .....(omitted in printing)..	1284	
Affidavit of W. J. Pike at hearing, &c. (omitted in printing)	1286	
Affidavit of L. R. Robins at hearing on restraining order .....(omitted in printing)..	1288	
Affidavit of L. R. Robins in support of application, &c. .....(omitted in printing)..	1291	
Affidavit of Frederick Bradshaw in support of application for restraining order and for survey and inspection .....(omitted in printing)..	1294	
Affidavit of W. V. Richardson in opposition to application for restraining order and for survey, inspection, &c. .....(omitted in printing)..	1297	
Affidavit of S. H. Brady in opposition to application for restraining order and for survey, inspection, &c. .....(omitted in printing)..	1300	
Order for inspection and survey, &c. (omitted in printing)	1303	
Bond on restraining order, &c. (omitted in printing)..	1306	
Agreement between Jim Butler Tonopah Mining Co. and West End Consolidated Mining Co., December 30, 1912, receipt, &c. .....(omitted in printing)..	1308	
Approval of cash bond .....(" ")..	1314	
Restraining order and sheriff's return of service (omitted in printing)	1315	
Bond on injunction *pendente lite* (omitted in printing)	1318	
Injunction *pendente lite* .....(omitted in printing)..	1320	
Stipulation as to reciprocal privileges on properties, &c. .....(omitted in printing)..	1322	
Stipulation as to injunction, &c. (" ")..	1324	
Agreement between Jim Butler Tonopah Mining Co. and West End Consolidated Mining Co. (no date) .....(omitted in printing)..	1326	
Stipulation as to time to answer (omitted in printing)	1329	
Order shortening time within which to serve notice of motion to set cause for trial (omitted in printing)..	1333	
Notice of motion to set cause for trial (omitted in printing)	1334	
Notice of motion to amend complaint (omitted in printing)	1336	

	Original.	Print
Affidavit of Frederick Bradshaw in support of motion to amend the complaint ....(omitted in printing)..	1339	
Motion for order permitting amendment to complaint .....(omitted in printing)..	1341	
Stipulation as to hearing, &c. (" ")..	1343	
Proposed amendment to complaint (omitted in printing)	1344	
Affidavit of Frederick Bradshaw for order to show cause and restraining order (omitted in printing)..	1347	
Undertaking on restraining order (omitted in printing)	1354	
Order granting motion to amend complaint (omitted in printing)	1357	
Order to show cause, restraining order, and sheriff's return .....(omitted in printing)..	1358	
Affidavit of Frederick Bradshaw for order to show cause and restraining order (omitted in printing)..	1362	
Notice of decision .....(" ")..	1369	
Order and stipulation as to filing memorandum of costs .....(omitted in printing)..	1370	
Order granting plaintiff ten days from and after filing of findings of fact within which to serve and file its objections, exceptions, amendments and additions .....(omitted in printing)..	1372	
Order as to time for filing memorandum of costs (omitted in printing)	1373	
Affidavit of Charles Ducheneau (and application) for order staying execution pending motion for new trial .....(omitted in printing)..	1374	
Stipulation as to time for filing memorandum of costs .....(omitted in printing)..	1377	
Notice of proposal by defendant of findings of fact and conclusions of law .....(omitted in printing)..	1378	
Findings of fact and conclusions of law (omitted in printing)	1379	
Stipulation as to proceedings, &c. (omitted in printing)	1380	
Suggested addition to finding IV to meet request of plaintiff, &c. .....(omitted in printing)..	1386	
Order continuing injunction *pendente lite* (omitted in printing)	1393	
Memorandum of costs .....(omitted in printing)..	1395	
Order extending time to file cost bill (omitted in printing)	1396	
Notice of making, signing, and filing findings of fact and conclusions of law.....(omitted in printing)..	1397	
Order extending time to file objections to findings, &c. .....(omitted in printing)..	1398	

	Original.	Print
Affidavit of Clyde A. Heller (and application) for injunction pending motion for new trial on appeal, stay of exception, and order preserving *status quo* of the property in litigation (omitted in printing)..	1399	
Order to show cause.....(" ")..	1404	
Notice of entry of judgment...(" ")..	1406	
Stipulation allowing defendant to mine vein in dispute and impound proceeds .....(omitted in printing)..	1407	
Stipulation extending plaintiff's time 20 days from written notice of order denying new trial to prepare and file bills of exceptions and record on appeal .....(omitted in printing)..	1414	
Stipulation for use of original records on appeal and regulating time and procedure of making record on appeal .....(omitted in printing)..	1415	
Stipulation for additional 30 days if clerk cannot make up bill of exceptions and record on appeal in 60 days from date of entry of judgment (omitted in printing)	1419	
Minute entries .....(omitted in printing)..	1421	
Restraining order set, &c. (" ")..	1421	
Approval of bond .....(" ")..	1422	
Order on stipulation as to injunction, &c. (omitted in printing)	1423	
Order issuing injunction, &c. (omitted in printing)	1324	
Order on motion for additional undertaking, &c. .....(omitted in printing)..	1425	
Order setting case for hearing (omitted in printing)	1426	
Hearing and order on motion to discharge attachment .....(omitted in printing)..	1427	
Application and order for injunction *pendente lite* .....(omitted in printing)..	1428	
Orders of hearings and trial (" ")..	1430	
Order of submission.....(" ")..	1464	
Application for stay of execution (omitted in printing)	1464	
Order reserving right to cancel order of May 27, 1915 .....(omitted in printing)..	1465	
Application and hearing for injunction (omitted in printing)	1466	
Order vacating order of May 27, 1915 (omitted in printing)	1468	
Orders continuing hearing of order to show cause .....(omitted in printing)..	1468	
Hearing on order to show cause (omitted in printing)	1469	
Withdrawal of application for injunction (omitted in printing)	1470	

	Original.	Print
Hearing on motion for new trial (omitted in printing)	1470	
Clerk's certificate to minute entries (omitted in printing)	1472	
Stipulation settling bill of exceptions (omitted in printing)	1473	
Judge's certificate to bill of exceptions (omitted in printing)	1473	
Clerk's certificate to bill of exceptions (omitted in printing)	1474	
Notice of appeal from order denying motion for new trial	1475	685
Undertaking on appeal (omitted in printing)	1477	
Stipulation settling record on appeal (omitted in printing)	1480	
Clerk's certificate to record and use of original documents on record on appeal (omitted in printing)	1481	
Stipulation as to exhibits, &c. (" ")	1482*a*	
Opinion, Norcross, C. J.	1483	686
Judgment	1507	703
Order extending time to file petition for rehearing	1508	704
Petition for writ of error and allowance	1509	704
Assignment of errors	1517	708
Bond on writ of error	1523	712
Writ of error	1525	713
Citation and service	1527	714
Certificate of lodgment	1528	715
Order for transmission of exhibits	1529	716
Præcipe for record	1530	716
Clerk's certificate to transcript	1532	717
Clerk's certificate to exhibits, &c.	1534	718
Clerk's return to the writ of error	1539	720
Clerk's memorandum of payment of costs	1540	721
Statement of errors to be relied upon and designation by plaintiff in error of parts of record to be printed and proof of service of same	1541	721

a In the Supreme Court of the State of Nevada.

No. —.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff and Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant and Respondent.

RECORD ON APPEAL.

b In the District Court of the Fifth Judicial District of the State of Nevada in and for Nye County.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Bill of Exceptions and Record on Appeal.

(Volume I.)

Be it remembered that on the seventh day of December, 1914, the above-entitled cause came on for trial, and a jury being waived and the respective parties having agreed to submit the said cause to the Court for determination without the intervention of a jury, the parties then and there entered into and filed a stipulation governing the order of the trial, and other matters therein set forth, which said stipulation is as follows, to-wit:

c In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Stipulation.

It is stipulated and agreed between the parties hereto as follows:

I.

That the motion of Plaintiff heretofore made to file an amendment to its complaint, amending Paragraph VII of said complaint and

Paragraph 3 of the Prayer of said complaint may be granted and said amendments or an engrossed amended complaint embodying said amendments may be filed as of the date of this stipulation:—that the answer of the Defendant to the original complaint shall be deemed and taken as the Answer to the amended complaint and the replication heretofore filed shall stand as a replication to said Answer; subject to all rights of amendments by permission of the Court.

II.

The title, ownership and right of possession to the ore bodies in dispute shall be first tried and determined by the Court before Plaintiff shall be called upon to introduce evidence as to tonnage and value of ore extracted by Defendant. The issues raised by said amended complaint, answer, and replication shall be tried in the following order:

As by said pleadings it is admitted that Defendant has been carrying on mining operations and extracting ore from underneath the surface of the Eureka and Curtis Mining Claims, owned by the Plaintiff, the Defendant shall proceed to introduce its testimony justifying its right to so mine and extract said ore. Plaintiff shall thereupon introduce its testimony in opposition to Defendant's and Defendant shall thereupon rebut the same. After the evidence has been fully taken in behalf of both parties on the issue as to title, ownership and right of possession, and argument therein had, such issue shall thereupon be submitted to the Court for its finding and decision.

III.

In the event that the Court finds in favor of Plaintiff on the issue of title, the question of the tonnage and value of the ores claimed to have been extracted by Defendant from underneath the surface of Plaintiff's mining claims and all other matters pertinent to that issue shall be brought on for hearing and trial by the Court by either party upon five days' notice one to the other. Plaintiff first introducing testimony, Defendant to follow, and Plaintiff to close with its rebuttal. In determining the tonnage and value there shall be included all such ores extracted and removed by Defendant underneath the surface of Plaintiff's mining claims prior to the commencement of this action, as may by the Court be determined to have been the property of Plaintiff, and shall also include all ore extracted and removed by Defendant from such property since the commencement of this action, which shall be adjudged to be the property of Plaintiff, and up to and including the date of the trial of such issue of tonnage and value. Upon the determination by the Court of the issue of tonnage and value, findings of fact and conclusions of law, embracing all the issues in the case, shall be signed and filed, and judgment therein shall be entered.

IV.

In the event said Court shall determine said issue of title in favor of defendant, findings of fact and conclusions of law shall be filed and judgment therein entered.

V.

Nothing in this stipulation contained shall be construed as a waiver on the part of either party of their respective rights to move to vacate or set aside any judgment which may be entered in this action, or the findings and conclusions of law made by the Court; or to apply for a new trial, or to appeal from said judgment or to take any steps in regard thereto as the respective parties may be advised.

VI.

Upon demand made in that behalf by Plaintiff, at any time subsequent to the announcement by the Court of its Decision on the issue of title, if such decision be in favor of Plaintiff, the Defendant will permit Plaintiff, its attorneys and an assistant to be nominated by Plaintiff, to inspect and take copies of all entries in the books of Defendant, relating to the tonnage and value of said ores, and to inspect and take copies of all assay sheets, memoranda of assays, maps, and other data, showing or tending to show the tonnage and value of said ores; and to give to said Plaintiff all information Defendant, its officers, and employees have in reference to said tonnage and values.

VII.

In the event said Court shall determine the issue of title in favor of said Plaintiff, and upon its announcement of such determination, the Court shall forthwith issue and set for hearing *and* order to show cause herein upon the application for a restraining order and injunction filed herein by Plaintiff on the second day of December, 1914.

Dated at Tonopah, December 7th, 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
W. E. COLBY,
J. H. EVANS,
Attorneys for Plaintiff.
PECK, BUNKER & COLE,
HORATIO ALLING,
CHENEY, DOWNER, PRICE & HAWKINS,
DICKSON, ELLIS, ELLIS & SCHUDLER,
H. H. ATKINSON,
Attorneys for Defendant.

g [Endorsed:] No. 2999. In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye. Jim Butler Tonopah Mining Company, a Corporation, Plaintiff, vs. West End Consolidated Mining Company, a Corporation, Defendant. Stipulation. Filed Dec. 7, 1914. Robert G. Pohl, Clerk, by Lowell Daniels Deputy. Robert G. Pohl, Clerk, Nye County, Tonopah, Nevada.

h Thereafter, the trial of the case began on December eighth, 1914, the parties introducing oral and documentary evidence and sundry exhibits consisting of models, maps, diagrams, ore samples and other instruments of evidence, the trial continuing from day to day from December eighth, 1914, to and including the eighteenth day of December, 1914, upon which last-named date the taking of testimony was concluded, and the case set down for oral argument.

The evidence so adduced at said trial, taken down stenographically and thereafter reduced to long hand, together with the several exhibits referred to, is as follows:

1 In the Fifth Judicial District Court of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Be it remembered, that the above entitled action came on regularly for trial in the said court on Tuesday, the 8th day of December, A. D. 1914, at the hour of Ten o'clock A. M. of said day before Hon. Mark R. Averill, Judge of said court sitting without a jury.

The plaintiff was represented by its attorneys, Curtis H. Lindley Esq., William Colby Esq., Hugh H. Brown Esq., and J. H. Evans Esq.

The defendant was represented by its attorneys, Messrs. Peck, Bunker & Cole, Messrs. Dickson, Ellis, Ellis & Schulder, Messrs. Cheney, Downer, Price & Hawkins, Horatio Alling Esq., and H. H. Atkinson Esq.

Thereupon, the following proceedings were had and testimony taken, to wit:

2 The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

(Both sides announce themselves ready for trial.)

Mr. Dickson: If your Honor please, under the state of the Pleadings, the burden of the proof on the issue we are about to try, namely, the question of ownership, is on the Defendant. And we have the opening of the case in the testimony, and I take it, in the argument also.

Your Honor, I have no doubt, from the number of motions on one restraining order that have come boefore the Court is familiar

with the issues in this case, but it may be not amiss for me very briefly to state the contention of the Defendant, and what we understand will be the contention on the part of the Plaintiff.

The contention on the part of the Defendant will be that in the territory in controversy there are two veins, two fissure veins, both having a course easterly and westerly; I do not mean due east and due west, but easterly and westerly course. These veins are not parellel in their course, but converge on their strike as you go to the east. They diverge in their courses downward, and converge in their course upward, until finally they intersect the south dipping vein which we will call, for convenience, the West End vein, and which our friends on the other side have a very long name for, namely, the MacNamara Tonopah Extension West End, something or other vein. We will call it the West End vein and refer to it in that way. That vein dips at an angle of from 20 to approximately, or nearly as much as 30 degrees from a horizontal. It has been followed in its downward course from what we
3 claim to be the top of the West End vein for a distance of over 750 feet.

The other vein, the north dipping vein, dips at an angle of, I should judge, about 20 degrees. I do not pretend to be exactly precise about it. The West End vein, or the south dipping vein, crosses the easterly end line of the West End claim and on its course at its apex departs from the northerly side line of the West End claim entering the MacNamara ground at a distance 1142½ feet.

Mr. Lindley: I understand the red indicates what you call the West End vein?

Mr. Dickson: The red indicates the West End vein, and the yellow indicates the MacNamara or north dipping vein. From the junction of the south dipping vein*g* and north dipping vein, the observation of our witness is that the north dipping vein continues on above the top of the south dipping vein. Not only does the fissure continue on upward, but the vein *or* quartz and the ore found in this fissure at various places—here is one just beyond—just east of the east end line of the West End claim on the Tonopah ground where we have this work driven practically on the strike, this level here (indciating) of the north dipping vein. Here we have a raise going up showing the dip of the north dipping vein there above the south dipping vein. In here we have another; the north dipping vein comes up a very considerable distance above the top of the south dipping vein. Here again for a short distance, here for a very considerable distance. Here again for some 80 feet, I should judge. Here again, here again, here again. Here again we have it going above the south dipping vein and way out we have it going up through the north dipping vein, going
4 up carrying quartz, carrying ore, not always commercial ore, at the same time we can get samples of rock in place from that rock above the top of the south dipping vein*g* carrying very considerable values.

Again, it will appear, I take it, as I understand, that at places

where we find the north dipping veing extending upward beyond the top of the south dipping vein, we find that the junction brought a change in the structure. The point of union of the two, we have the south dipping veing dipping to the south, and the north dipping vein having its dip to the north. Each of these are fissure veins. I do not mean by that that they are typical fissure veins having a sharp and well defined wall throughout and with all the ore, the full mineralization contained between the walls of the fissure, yet fissure veins in this sense, that the ore makes out from a fissure both on the north and south dipping veins into the foot wall country, impregnating replacing the foot wall country for varying distances from a few feet to 20 or 30 feet, I think, in places; the foot-wall has been replaced or impregnated, sometimes converted into merchantable ore.

That occurrence, that impregnation or replacement, so far as the hanging wall country is concerned, is, speaking generally, not found. At rare intervals and to a very limited extent has the replacement affected the hanging wall country. The hanging wall of the two veins is throughout a sharply defined, smooth, and no doubt about it when one would encounter it. Of course, as we would expect in these converging fissures, converging in their upward course, when they come to meet, to unite, and for some distance below the
5 point of claim of junction, we have what we would expect to have, the intervening foot-wall country, the two veins being soluble and such as could be acted upon by the mineralizing solutions, altered, replaced, impregnated, we have, as I say, in some places below the point of junction quartz and vein material making out from one fissure to the other fissure. Of course, as we would expect, having two fissures, uniting in that way in the quartz, at and in the vicinity, or immediately below for some distance to the point of junction, we have what we naturally expected, the intervening rock between these two is changed, giving more access to the circulation of the solutions from which these ores of either vein were deposited. On the other hand, I understand from the pleadings, from the replication of the Jim Butler Company interposed to the answer of the Defendant, the West End Company, and the answer of the Jim Butler Company filed to the Complaint in the case of the Jim Butler Company against the West End Company, involving the Fraction Claim, I infer from those answers that the contention of the other side will be that there is but one vein here and that it has no top at all. It is simply a roll, anticlinal fold. Now, as I view the law, this will still be the top or the crest of that anticlinal fold, unbroken, would be, within the meaning of the Act of Congress, the top of the vein. Goes down indefinitely from that common apex, if there were but the one vein, having an unbroken crest. Otherwise, of course, it would be a vein without any top.

Mr. Lindley: Giving you an extralateral right in both directions?

Mr. Dickson: In both directions, yes. As much so as
6 though we had two entirely separate and distinct veins. As-

sume that the end line of the claim, of our claims—our claims were parellel throughout and we had two separate and distinct veins, both crossing the end lines, the claims having separate apices, the one dipping to the south and the other dipping to the north. Our contention is we could follow both extralaterally. Both are extralateral rights being limited on both by planes drawn through the end lines extending indefinitely.

Mr. Lindley: May I ask, Judge Dickson, on whic- of the two veins is the discovery?

Mr. Dickson: On the north dipping vein.

Mr. Lindley: And then as to that, if it is assumed that is the discovery vein, the other vein is a secondary vein?

Mr. Dickson: Yes, in our views they being separate veins yes.

Mr. Lindley: After Counsel's statement as to their views of the Plaintiff in this case, we prefer to defer our statement until we open.

7 GEORGE W. PIERCE, being called and duly sworn as a witness on behalf of the defendant, testified as follows to wit:

Direct examination.

Mr. Dickson:

Q. What is your full name Mr. Pierce?
A. George W. Pierce.
Q. What is your age?
A. Fifty-one.
Q. Where do you reside?
A. In Los Angeles.
Q. What is your business?
A. Mechanical draftsman or model maker.
Q. Did you graduate at any school?
A. Why, at a normal school.
Q. What normal School?
A. Ainsworth Academy in Iowa.
Q. When did you graduate?
A. Well, in '78 or '80 I am not positive.
Q. Have you followed your profession since that time, studied it?
A. Yes, sir.
Q. You are employed by the defendant in this case, the West End Company to construct a model of the underground workings of that companie's mine, were you not?
A. Yes, sir.
Q. When were you employed,—when did you enter upon your work of constructing the model?
8 A. The 22nd. of July of this year.
Q. And how continuously have you since then been employed in the work of constructing the model?
A. Ever since.

Q. Mr. Dickson: I wish to have this model marked for identification, as defendant's exhibit One.

The Court: It will be marked Judge Dickson in due time. The

defendant's exhibits are usually marked with letters. This will be known as defendant's exhibit "A" for identification.

Mr. Dickson:

Q. Calling your attention to the model at your right, which is, or will be marked for identification as Defendant's Exhibit "A" I ask you if you constructed that model?

A. Yes, sir.

Q. From what data did you construct it?

A. From maps and drawings furnished me from the engineer's office.

Q. What Engineer?

A. The West End office.

Q. Who was the Engineer?

A. Well, Mr. Bouderman, Mr. Dodge, and Mr. Parker the draftsman.

Q. Now, what is the scale of the model?

A. Forty feet to one inch; one inch represents forty feet.

Q. And is that true of every raise and every level and every winze represented on that model?

A. Yes, sir.

Q. All drawn to that scale?

A. Yes, sir.

Q. You had the notes of the survey to aid you in constructing the model?

A. No I had no access to the notes.

9 Q. I will state—did Mr. Richardson check this model with you from time to time, as it was being constructed?

A. He checked quite a good deal of it I don't know how much.

Q. Is the model constructed correctly—It is in accordance with the date which you say you used?

A. Yes, sir, it is.

Mr. Dickson: I think that is all.

Cross-examination.

Mr. Lindley:

Q. The correctness of the model of course depends upon the correctness of the survey?

A. Yes, sir.

Q. You did not make any of the surveys yourself, therefore you are not a surveyor?

A. No, sir.

Mr. Lindley: We have no objection to the model going in subject to such criticisms as we have to make after our engineers have an opportunity to inspect it.

The Court: The model will be known as Defendant's Exhibit "A."

Mr. Lindley: That is all.

WARREN V. RICHARDSON, being called and duly sworn as a witness on behalf of the defendant, testified as follows, to wit:

10 Direct examination.

Mr. Dickson;

Q. Your name and your age Mr. Richardson?
A. Warren V. Richardson, age thirty seven.
Q. And you reside where?
A. Tonopah, Nevada.
Q. How long have you resided in Tonopah?
A. Twelve years.
Q. What is your business?
A. Surveyor and engineer.
Q. Did you graduate at any school of mines?

Mr. Lindley: We will admit Mr. Richardson's qualifications as survey- and engineer.
Mr. Dickson: All right.

Q. You are in the employ of the West End company, the defendant in this case?
A. I am.
Q. How long have you been in the employ of that company?
A. Nine years.
Q. You have made a survey of all of the underground workings of that company both within its—within the boundaries of its West End Claim and all workings of that company done beyond its vertical boundaries?
A. I have, either myself or under my direction.
Q. At the time or times or during the period that you were engaged in making surveys of those underground workings, was there or are there now any old workings that were inaccessible to you?
A. I think not, within the boundaries of the West End Claim.
Q. Well, the workings of the West End company beyond its vertical boundaries,—are there any that are now inaccessible?

11 A. Yes, there are workings beyond the boundaries that are inaccessible.

Q. You can point those out on the model?
A. Yes, sir.
Q. How closely, if at all, Mr. Richardson have you checked the work of Mr. Pierce, on this model with your notes?
A. I have checked it sufficiently to testify to its accuracy.
Q. How is that?
A. I have checked it sufficiently to testify to its accuracy.
Q. What do you say as to whether or not it is accuarate in accordance to your survey, in all its details?
A. It is.
Q. What is the red color on that model intended to represent?
A. Represents the West End or south dipping vein.
Q. And the yellow?
A. The north dipping vein.
Q. This looks to me like black—what is that intended to represent?
A. That represents rhyolite.

Q. This very dark brown is what I am pointing to?
A. It is called rhyolite.

Mr. Lindley: Tonopah rhyolite?
Mr. Dickson: I don't know, just call it rhyolite.

Q. And the purple what is that intended to represent?
A. The purple represents trachyte.
Q. And the green wherever found on the model, what is that intended to represent?
A. The light green represents a-desite-cap and the dark green represents Brougher dacite-cap.
Q. So that the green wherever shown represents the cap-
12 rock whether it be the brougher or the andesite?
A. Yes, sir.
Q. What is the blue on the model, what is that intended to represent? What does the blue represent wherever you find that color?
A. The blue represents faults.
Q. Is that true in every instance where you find blue? I call your attention to stations 461 and 456 or 459, I guess it is, two little narrow blue strips, is that intended to represent faults?
A. It is.
Q. On this model where we have the blue, is the extent of the dislocation or throw of the country where it has been appreciable indicated on the model?
A. Wherever the workings have been displaced, and the model represents the workings, its shows that displacement.
Q. For instance in Calling your attention to what we have in blue here where you find the figures 409 from the top to the bottom of that, does that represent the extent of the drop or throw?
A. Not necessarily, because that only shows one segment of the faulted section.
Q. Does that show the extent of it in that immediate segment?
A. It shows a partial extent of the displacement.
Q. The entire segment there is not developed, not determined?
A. Not to my knowledge.
Mr. Lindley: That is an up-raise along the fault?
A. Yes, sir.

Mr. Dickson:

Q. Now, I see a number of places on the model where we have a neutral or grey color, what is that intended to represent?
13 A. Well, that is just a neutral color, the neutral color is just a priming coat for the model. It does not represent geology.
Q. State whether or not in your judgment, and from your examination of this model, all of the underground openings made by the defendant, the West End Mining Company in the territory here in controversy are represented on that model?
A. All of the openings made by the West End Mining Company that are accessible are represented on the model?

Q. Where are there any workings not accessible and therefore not shown on this model?

A. Well, I will change that Judge, all of the workings within the boundaries of the West End Claim are represented on the model.

Q. Every opening?

A. Every opening.

Q. And southerly of the south side line of the West End claim, are all the workings and openings that have been made by the West End company or by the Jim Butler Company, within the limits covered by this model, are they shown on the model?

A. I wouldn't say that the workings outside of the West End claim itself are complete in all respects; *there* are complete as far as the maps that were furnished us.

Q. Of course I understand. I will get at it this way. Are all of the workings referred to in my former question that have been driven prior to the first day of November of this year shown on this model?

A. Within the West End claim, yes, sir. But within the boundaries of the claims adjoining the West End shown on the model—the work on the model is complete as far as our maps and surveys have taken them. There is some places that are inaccessible and there is some work that is unimportant.

Q. Well all the workings or openings of which you have made surveys—are they represented in the model down to the first of November of this year?

A. They are.

Q. And the extent of any workings of which you have not made survey and which you have not shown on this model, are they minute or considerable?

A. No, would be very inconsiderable.

Q. Do you understand that this model is intended to be a true representation or reproduction of all of the underground workings in the West End Mining Company's claim and the workings done by the West End mining company beyond the southerly side line, with the limitations you have already given?

A. It is.

Q. Have you the notes of your surveys with you so that Counsel for Plaintiff, if they wish to, may cross examine you on them?

A. They are available.

Q. You have them with you here in Court?

A. I haven't them in Court, no.

Q. Will you bring them at noon?

A. Yes.

Mr. Lindley: I suppose the notes have been platted, are they not, Judge Dickson, so far as their horizontal plan is concerned?

Mr. Dickson: Yes; I might say that the composite or general plan map was not completed this morning, some coloring to be done, and we will have it here at noon.

Q. This model is drawn upon the same scale as your composite or horizontal line map?

A. It is, forty feet to the inch.

Q. And the numbers found upon this model, of which there are a very great many, are the workings, and the work in which any one or more of these numbers are found, have a corresponding number upon the composite map?

16 A. Yes, they have.

Q. What is the wire top of this Defendant's exhibit "A" intended to represent?

A. Represents the contour of the surface.

Q. Is that from the surveys made by yourself, or under your direction?

A. Or under my direction.

Q. You may pull down, Mr. Richardson, such maps — are in the case here. Never mind that, I can recall you after the noon hour.

Mr. Lindley: I think, Judge, you can go right along.

The Witness: We will take these plans first, if you wish.

Mr. Dickson: I would like to have this marked Defendant's Exhibit B. The record will be confused if they are not marked.

Q. I call your attention to the map marked Defendant's Exhibit "B," and ask you what that represents?

A. That Exhibit "B" represents the 200 level of the West End mine and other mines adjoining on the same elevation.

Q. What claims are represented in whole or in part upon the exhibit "B"?

A. The West End, MacNamara, Burro, Valley View, Eureka, Curtis, Heller and Sunset.

Q. The West End is represented on that exhibit in full, is it?

A. It is.

Q. And is it correctly platted, according to your survey?

A. It is.

Q. A portion of the other claims named are represented on that map, are they—those portions correctly platted?

17 A. They are.

Q. I wish you would explain the workings, underground workings that are displayed upon Exhibit "B"?

A. The underground workings which are on this exhibit are the workings from the 200 level of the West End main shaft to the MacNamara shaft and drifts and cross cuts on this level. From the 200 level of the West End, there is a raise 250, connecting with the intermediate, and the stope shown on the map. Above the 160 level, a raise 160 connects with an intermediate level, a raise 154 also connects with an intermiedate level above.

Q. Go ahead. I want all the openings.

A. You want all of the raises mentioned in detail?

Q. Yes.

A. The Porcupine shaft is shown on this map where it intersects the level.

Q. Well, how is it designated on the map, so the record will show what you are referring to?

A. Porcupine shaft is designated on the map by its name.

Q. Well, give it?
A. Porcupine shaft, collar elevation 6042.

Mr. Lindley:

(Q.) What is your datum, please?
A. 5816.
Q. The datum plane. Do you take the sea level, or arbitrary level?
A. Oh, the sea level elevation.
Q. Then, your elevations are all plus elevations?
A. Yes.
Q. Proceed.
A. I have shown the—this map shows the stopes between——

Mr. Dickson:

(Q.) Just wait a moment. Are there any other workings
18 on the map before you come to the stopes which you have not called attention to, in through here?
A. I will go right along the level, Judge, and name them in detail.
Q. All right.
A. Commencing at the West End shaft, the map shows the workings on the 200 level going north along cross cut 201, to a cross cut 202, going west to drift 203.
Q. What is that?
A. Which follows along——
Q. Drift 203, did you say?
A. Yes.
Q. Just give the station number. What is the yellow on that exhibit B intended to represent?
A. The yellow on this map represents the north vein.
Q. The north dipping vein. And the red?
A. The West End vein, south dipping vein.
Q. Are all of the workings on or above the 200 level, all the workings of the Defendant company shown upon that exhibit "B"?
A. They are.
Q. Are they correctly platted, according to the notes of your survey, or the surveys made under your direction?
A. They are.
Q. Turn down the next map. Calling your attention to the map marked "Defendant's exhibit C," I will ask you of what level that is a map?
A. That is the 300 level of the West End. And the third level of the Jim Butler.
Q. How is the third level of the Jim Butler colored on that map?
A. Well, the color represents the geology, Judge.
Q. Well, what is the color that is shown on that map intended to represent the Jim Butler——
A. It is the purple to the largest extent.
Q. The working colored purple there is intended to

represent the geology of what you referred to as the Jim Butler 300?

A. Yes, the major part.

Mr. Lindley:

(Q.) May I ask if the geological coloring on the maps follow- the same scheme as on the model?

A. Yes.

Mr. Dickson:

(Q.) Are all of the workings of the West End Company of the 300 level displayed on that map?

A. They are.

Q. And the red there represents the West End?

A. Yes.

Q. Go to the next one. Are the claims or the portion of the claims that are platted on this exhibit "C" correctly platted?

A. They are.

Q. And the workings shown thereon are correctly platted, according to your surveys?

A. They are.

A. Calling your attention to the map marked "Defendant's Exhibit D," I will ask you what that is intended to represent?

A. Represents the 400 level of the West End and the working in the adjoining mines at the same elevation.

Q. Does that represent all of the workings of the Defendant, the West End Company on that level?

A. It does.

Q. Represents them correctly?

A. It does.

Q. And the color scheme is the same on the model as on the other maps just referred to?

A. Yes, sir.

Q. And are the workings displayed on this exhibit correct according to your surveys?

A. Yes, sir.

Q. And the claims thereon are also correct?

A. Yes, sir.

Q. Take the next one. Directing your attention to the map marked "Defendant's exhibit 'E' "?

A. Yes, sir.

Q. Of what level is that a map?

A. That is a map of the five hundred foot level of the West End.

Q. Of what?

A. Of the five hundred foot level of the West End and of the workings in the adjoining mines from approximately the same elevation.

Q. What adjoining mines?

A. The Jim Butler and the Tonopah Mining Company on this sheet.

Q. The Tonopah Mining Company's workings are shown upon

this plat immediately east of the West end line of the West End claim?

A. Yes, sir.

Q. And the workings of the Jim Butler company shown upon this exhibit are in purple as before?

A. Well, it is rather confusing because there is so much purple on the others.

Q. Can you give the beginning and the end of the workings
21 on that map that are Jim Butler workings?

A. Yes, sir. The Jim Butler workings extend as shown on the map from near the Fraction No. 1 shaft.

Q. So designated on the map?

A. So designated on the map, and to the southern boundary of the West End Claim taken in a northwesterly direction.

Q. And do the cross-cuts or openings from that, extending from the level that you have just designated—are they also Jim Butler workings?

A. They are.

Q. Does that map show all of the workings of the West End *End* company on that level?

A. It does.

Q. Are *are* they all correctly platted according to your survey?

A. They are.

Q. And the claims are correctly platted as shown on that exhibit "E"?

A. Yes, sir.

Q. Coming now to defendant's Exhibit "F"—that is a map of what level?

A. That is a map of the six hundred level of the West End and of the adjoining claims at approximately the same elevation.

Q. You mean the Jim Butler workings?

A. And the Tonopah Mining.

Q. And are all the workings of the West End company displayed on this map?

A. They are.

Q. Correctly, according to your surveys?

A. They are.

Q. And the claims are correctly represented there to?

A. They are.

Q. So far as they are represented?

A. They are.

22 Q. Now go to the next one. Calling your attention to defendant's Exhibit "G" is that intended to represent the sections on it, marked section "A" at the bottom of the map, Section "B" Section "C," Section "D" what is section "A"? Is that a cross section?

A. Section "A" represents a cross section.

Q. Taken how near the east end line of the West end?

A. Represents the section as shown on the plan, exhibits B, C, D, E, & F.

Q. How is that?

A. Represents the section as shown on the plan, exhibits, B, C, D, E, & F.

Q. Well, we have got the plan map before us, and show us on just what line that section or plan is taken?

A. Yes, sir.

Q. The section B,—that is another cross section?

A. Yes, sir it is.

Q. And through this vein or cross section?

A. Yes, sir.

Q. And is that true of section C, and also of section D?

A. It is.

Q. And coloring there the yellow is intended to represent the north dipping vein?

A. Yes, sir.

Q. And the red the south dipping vein?

A. The red the south dipping vein and the yellow the north dipping vein.

Q. Yes, that is what I intended. The south dipping vein on the model, and what else does it show?

A. The red also represents the Fraction vein.

Q. What are the markings on that section A of exhibit G, is that the fraction vein? So that the record will be able to identify them?

23

A. North cross-cut 602.

Q. Point to it.

A. (Indicating.)

Q. Any other workings?

A. Stope No. 6.

Q. That is also on the Fraction vein?

A. Yes, sir. West drift 702.

Q. And the purple on section A, Exhibit G, is intended to represent*ed* what?

A. The purple represents trachyte.

Q. Above and below this south dipping and this north dipping vein?

A. Yes, sir.

Q. And what is this color down here, this brown color?

A. That represents West End rhyolite.

Q. Just opposite the word intermediate,—between the word intermediate and the word extended and known,—what is that intended for?

A. West End rhyolite.

Q. Going to section B on Exhibit G, there is the yellow representing of course the north dipping vein, and the red representing the south dipping vein?

A. Correct.

Q. And the red marked "Fraction vein" on this section B, and in it we find also a mark "Raise 718" West Stope No. 8, W. D. 702, repeated, W. D. 702 and down to the foot of the workings marked "Raise 601-A,"—are they all on what you call the Fraction Vein?

A. They are in whole or in part.

Q. And the purple there represents the geology as you stated before?

A. Yes. The legend at the bottom of the map shows.

24 Q. Now coming to "C"—that is a cross section taken where?

A. This cross section C is taken through the McQuillan shaft on the West End claim.

Q. And the mine is shown on your plan map?

A. It is, yes, sir.

Q. Is the Fraction vein shown upon this section C?

A. It is.

Q. And how is it designated on the map? Just so we will not get it confuesed with the West End here?

A. The Fraction vein is designated by the red vein passing through 422-D, 422-N. R. 422-A.

Q. And to what figure?

A. To the figure 16 ft. E.

Q. Any other portion of what you call the Fraction Vein shown upon this section?

A. How is that?

Q. Is there any other portion of what you call the Fraction Vein shown upon this section?

A. Yes, sir. There is a segment of the Fraction vein shown above the south vein as designated.

Q. A mark over it?

Q. The West End vein?

A. The West End vein.

A. And marked over with the word "Fraction."

Q. And what is the blue line there intended to represent, between these two portions or segments of what you referred to as the Fraction vein?

A. The blue line represents a fault between the segments of the Fraction vein.

Q. And what is the purple here? Represents trachyte here on this section I take it?

A. Yes, sir.

Q. Lying above all of the veins?

A. Yes, sir.

Q. And what color do you call this between the veins?

25 A. That is brown.

Q. What is that intended to represent?

A. West end rhyolite. Well, I will say rhyolite.

Q. Take section D. that is another cross section taken from these veins?

A. It is.

Q. That is, as I understand it, taken near the west end of the stope on the West End claim?

A. It is.

Q. The purple there represents trachyte, as I take it?

A. It does.

Q. Is there any vein represented or intended to be represented on that map, other than the west end vein proper, colored in red?

A. There is a separate vein or a branch of the West end vein,—I am not testifying as to what it is.

Q. As an expert?

A. Yes, sir.

Q. But you know what it is intended to represent on this section in which we find the following letters and figures,—D. 502, R. 586, 445 I, W. 440; D. 409; R. 440, and then continuing—upward to the determination; what is that?

A. That represents the position of a vein.

Q. That lies above what we call the West end vein?

A. It does.

Q. But whether it is part of it or not you do not undertake to venture an opinion; you are not an expert?

A. That is right.

Q. How on all of your maps are your station numbers indicated?

A. They are indicated,—on the ground and on the map?

Q. On the map?

A. They are numbered, indicated by numbers and in some cases by letters after the numbers.

26 Q. Almost universally the station is indicated by a circle with a number?

A. Yes.

Q. How are your elevation points designated upon all of your maps?

A. The elevations are designated upon all the maps by the initials E. L.

Q. Followed by the number?

A. Followed by the numbers of the elevation.

Q. And your datum plan was the sea level?

A. Yes.

Q. You stated that this model Exhibit "A" was intended to, and substantially does show all of the underground workings of the Defendant Company. I am reminded that far below any workings shown on the model there are other workings of the Defendant Company within the boundaries of the West End claim. Is that true, that are not shown on the model?

A. Yes, but they would not come within the plane base.

Q. Yes, I know, but I just want to make your answer correct. How far beneath—those underground workings are downward and branching off from this shaft?

A. The shaft cuts those.

Q. What shaft?

A. The main shaft of the West End.

Q. Point it out on the model.

A. (Witness does so.)

Q. The one you are now pointing to. How is it designated, if at all, on the model?

A. The shaft is marked West End shaft.

Q. Now, how far beneath any of the stopes or workings shown on

the model do you go down in that shaft before you encounter
27 any other workings running off from the shaft?
A. About 350 feet.

Mr. Dickson: I think that is all that is necessary in direct, Mr. Lindley.

The Court:

(Q.) Mr. Richardson, what do you mean by the McQuillan shaft?
A. The shaft in the eastern portion of the West End claim, Judge.

Mr. Dickson:

(Q.) How is that marked, if at all, upon the model?
A. That shaft is marked, "McQuillan's shaft."

Mr. Lindley:

(Q.) That is the discovery shaft of the West End, is it not, Mr. Richardson? The McQuillan shaft is the discovery shaft of the West End? That is the shaft on which the patent is based?
A. It is the continuation of the discovery shaft.

Mr. Dickson: In that shaft was the discovery.
Mr. Lindley: In that shaft. You do not want to concede, of course, that you did not have any discovery.

Cross-examination:

Mr. Lindley:

(Q.) Mr. Richardson, this colored scheme that has been adopted in the model, particularly with reference to the geological definitions, are you responsible for that?
A. No. The coloring shown there to designate the different formations put on by instructions.
Q. You determined those formations for yourself or were you instructed to put them on there?
28 A. I was instructed to put them on.
Q. Then, you do not hold yourself responsible for the geology?
A. No, I do not.

Mr. Dickson: We did not put him on as an expert at all.

Mr. Lindley:

(Q.) How about the naming of those different rocks, the names by which you have identified the coloring? Who is responsible for the naming of those, you, or the geologists?
A. The geologists.
Q. You have simply painted the model and colored your map under the direction of the geologists?
A. They were colored, yes, under direction.
Q. They are done under your direction, however?
A. Yes.

Q. And the coloring was put on by the geologists. Now, may I ask you, briefly, to repeat the names given to the different rocks as identified by the different colors starting with the—I take it that the yellow and the red indicate veins, the yellow indicating the north dipping vein, and the red is what you call the West End vein, and in parts the Fraction vein. Is that correct?

A. It is.

Q. So that the only colors we have to deal with on the subject of geology are colors other than the red and yellow?

A. It is. And blue.

Q. Blue represents faultings. Now, you said the light green represented what?

A. Andesite cap.

Q. That is the andesite, no prefix to it to determine what kind of andesite it is or anything of that kind, just andesite. Plain andesite.

A. Well, andesite cap.

29 Q. That is the cap rock that overlies the entire vein system. Is that right?

A. Yes.

Q. Well, you do not know, you are not a geologist; pardon me. Now, the dark green represents what?

A. Brougher dacite cap.

Q. Now, your purple?

A. Purple represents trachyte.

Q. Without any qualifying or classifying adjective, just plain trachyte. The black or brown, what is that? Brown, that dark brown?

A. Yes.

Q. What is that?

A. Represents rhyolite.

Q. Now, have we any other colors typical—that is, identifying the geological structure according to the designation given you?

A. No, that is——

Q. That is all. In reference to the stopes colored yellow within the MacNamara boundaries, these were made from actual surveys?

A. They were.

Q. And that is true of all of the stopes shown upon the model and upon your maps?

A. Yes sir.

Q. Are all the workings in the MacNamara ground within this section of the mine shown upon this model?

A. No sir.

Q. Why were they not shown?

A. They are inacessible.

Mr. Dickson: I can not hear you.

A. In many places they are inac-essible.

Mr. Lindley:

(Q.) But such as are represented here are represented by actual survey?

A. They are.

Q. I believe that both sides to the controversy have had the opportunity of surveying in the MacNamara ground so we
30 should have the same data that you have?

A. Excepting there are places where the stopes are caved; there are sections of the MacNamara that are caved now that I had the notes before they were caved.

Mr. Dickson: As shown on this model?

A. Yes.

Mr. Lindley:

(Q.) Were you formerly the surveyor for the MacNamara?

A. Yes.

Q. Then, much of these stopes—many of these stopes are now inaccessible, but they are correctly marked on here from notes made by you before the ground caved?

A. Yes.

Q. That is correct, is it?

A. Yes.

Q. And you have those notes?

A. Yes.

Q. Have those notes been available to the Jim Butler Company?

A. Yes sir.

Q. They have had copies of those notes?

A. Oh, no, they have been available to them. Whether they got them or not, I could not say.

Q. You mean that if they had asked for them, they could have gotten them?

A. Yes.

Mr. Dickson:

(Q.) And can now?

A. And can now.

Mr. Lindley:

(Q.) You do not recall that they have asked for them?

A. They may have had them, yes. I did not get them——

Q. I do not apprehend that there is going to be any controversy over them, but I just wanted to get at what can be inspected on the ground now and what is closed. What portion of these stopes in the McNamara are closed, caved?

31 A. The stopes that are caved are mostly about the center of the claim; and the stopes near the western boundary of the MacNamara claims, near the top, are caved. I can't say exactly the extent of the cave.

Q. Now, with reference to the workings beyond and to the east of the West End boundaries, those are in the workings of the Tonopah Mine, are they not?

A. It is.

Q. Both parties have access to those mines?

A. Yes, I understand so.

Q. Does that represent all the workings adjoining the West End

boundaries within the Tonopah mining ground that are accessible at this time?

A. No, represents as far as we are able to get with the model in the time that we had.

Q. Well, that don't purport to be a complete representation of all the underground workings in this section of the Tonopah mining ground?

A. It does not represent all the workings, but as far as the portion shown here is represented, it is complete.

Q. Of course, if it is there it is there. But what I wanted to convey is as to whether there is anything left off there that might have been put on.

A. No, there is nothing left off the portion that is shown that might have been put on.

Q. That is obvious, also. I am trying to get at how complete is this in reference to an exposure of what is shown on those workings adjoining the West End line? I am not trying to trap you at all, Mr. Richardson, I am trying to get at the facts. I haven't anything up my sleeve at all in reference to this. I simply
32 want to know what the conditions are. There seems to be quite a large gap in here, and I want to know whether there are other workings here which are accessible and might have been put upon that model?

A. There are no workings in the immediate vicinity of the portion that is shown here. The workings that are adjoining the West End claim that could be shown here, a few hundred feet to the north of the portion are shown.

Q. In making the survey for the purpose——

Mr. Dickson:

(Q.) 200 feet to the north of what?

A. Of the portion of the Tonopah Mining Company workings here shown.

Mr. Lindley:

(Q.) Now, in making the surveys for the purpose of constructing this model in thar section of the underground works in the Tonopah mining ground, did you stop those surveys at these particular points on your own motion, or were you instructed to stop them?

A. No, I didn't have——

Q. Did you stop on your own motion?

A. Yes.

Q. You simply surveyed those——

A. Went as far as we had time, Judge.

Q. As far as you had time. Now, I notice overlying the lower stopes of what you call the West End vein, you have indicated an upper series of stopes painted in red. That you say is represented upon your horizontal plans and in your cross sections as the Fraction vein?

A. It is.

Q. Why did you paint it the same color as the one below?
33 Why didn't you give it a different color?
A. You will have to ask the geologists for that.
Q. Then, so far as your instructions with reference to coloring the maps and models, you have delineated under instructions from the geologists three veins; the yellow vein, what do you call that vein?
A. The north vein.
Q. You call that the north vein. The West End—the red vein, what do you call that vein?
A. The lower red vein, called the West End vein.
Q. And the upper?
A. The Fraction vein.

Mr. Lindley: I do not understand, except for geological purposes, the Fraction vein is involved here, Mr. Dickson?
Mr. Dickson: I do not think so, so far as this case is concerned.
Mr. Lindley: Yes, so far as this case is concerned, I mean.

Q. Are there any other veins that you identify, or are shown in any of the works here on this model?
A. Yes; I would not identify them myself as to what they belong to, but there are other veins shown on the model.
Q. Are there any veins in the west section here on the model that are not identified by name other than the West End?
A. In regard to the portion, upper portion of the model, above raise 580 as shown on the model, there is a vein.
Q. What do they call that vein?
A. I haven't—I am not aware that it has been designated,
34 yet.
Q. Did you ever hear of a vein called the South vein?
A. Yes.
Q. Is that the South vein?
A. I think so.
Q. You think it is the South vein?
A. Yes.
Q. Now, with reference to your cross sections, your exhibits—your plan exhibit giving the direction of the cross sections, will you pull that down? This shows "C" and "D."
A. The cross sections are shown through "CC" and "DD."
Q. Where is "A" and "B" and the others?
A. On this plan——
Q. Now, I want to ask you with reference—are these cross sections all parellel to each other, or are they drawn at arbitrary angles?
A. They are drawn at arbitrary angles, I would say.
Q. Who gave the directions as to the manner in which those cross sections should be made?
A. I selected the line. I was given directions as to what workings were to be shown, and then I took the exact line through those workings.

Q. Then, the cross section is not drawn parallel to any particular base line at all with reference to the course or strike of the vein?

A. No.

Q. It was arbitrarily, for the purpose of showing and connecting up existing works below with certain features above, is that correct?

A. They were taken to best represent all the workings in a certain direction.

Q. And that direction varied with each cross section?

35 A. Yes.

Q. Were run so as to go through the workings. In other words points were given to you and you prepared the cross sections to indicate what would be cut by a line or a plane connecting those point-, is that correct?

A. No, Judge, they were just like my instructions in the McQuillan shaft—was to take a cross section through the McQuillan shaft.

Q. And did they give you any direction as to the cross section?

A. They did not, except that it was to be through the McQuillan shaft.

Q. Well, why didn't you run it parallel with the end line, or at right angles to the shaft instead of giving the diverging course indicated?

A. Because the furtherst workings to the north in the West End Claim were *on* approximately on a line with the section taken, and any other line would not have represented, would not have represented the workings so well as that.

Q. Well, then, the idea was to connect the workings and not particularly to show vein structure?

A. That was my idea, to show the——

Q. Well, in all instances were you given the direction which your cross section was to take?

A. I was not.

Q. Well, did they simply tell you to run a cross section so as to connect up the workings?

A. Told me to select—I was told to select three workings in the eastern part of the territory, the eastern part of the territory, and one section in the western portion of the territory.

Q. Generally speaking are any two of those cross sections

36 parallel to each other, or approximately.

Q. Are approximately, but they were not laid out with the intention of being parallel.

Q. Well what is the purpose of a cross section?

A. The purpose of a cross section would be to represent *the* as much of the workings as possible within that section, to show the position of the vein in those sections, and are therefore taken approximately on the dip of the vein.

Q. What do you mean by the dip of the vein. The local dip at the point or the general dip?

A. The general dip.

Q. Well, if you take it on a general dip that would make your sections parallel wouldn't it? Didn't you consider—withdraw that

last question—Don't you consider Mr. Richardson, the structural conditions through which cross sections are usually made, that they could be taken at intervals and be parallel with each other, definite intervals, and exhibit whatever the plane of the cross section happened to strike. Isn't that the usual way of making cross sections?

A. I would not say so Judge. I would say that the cross section should be taken to illustrate the workings that you desire to show.

Q. Yes, but the workings cut no figure. It is the ore isn't it.

A. Well, the workings show the—No, the workings have an important bearing upon getting at the ore.

Q. Well, what I am trying to get at is this? It is very easy to start a structural condition by giving a cross section, is that not true?

A. There was no such intention as that.

Q. I do not accuse you of that, I am asking you generally if there is not an opportunity of a direction to a cross section, to
37 distort that to the facts.

A. Personally, I do not care for cross section at all.

Q. Will you kindly answer my question. The lawyers have to have it you know,—because we always get criticised. I am going to find out who is responsible for the directions given to those cross sections, and ask you to answer my question, isn't there an opportunity for unfairness in drawing cross sections?

A. There might be Judge, in some cases.

Q. Not in this case?

A. Not in this case.

Q. Now, in drawing these cross sections, and depicting, what is encountered by your plane through your cross section line, have you only marked the things actually cut by that plane, or have you forked something on it?

A. For the purpose of clearance and for the purpose of continuity it is necessary to project to that line, if that is what you mean.

38 Q. In other words, if the plane of the cross section does not show the exact facts, you have to go out some distance to project some things into the plane of the section to show them?

A. It is absolutely necessary in all cases.

Q. Well, how far have you wandered out from each side of your plane in order to project things in; how far is the maximum distance that you projected into the cross section?

A. I am not prepared to state that off-hand exactly, Judge.

Q. Now, let me have cross section "B"; there is a stope here marked on the map "C" stope, colored red, and then up over the yellow and around to 537-I; is that 537-I?

A. Yes, sir.

Q. Is that all one stope?

A. No, Judge. The stope stops where the cross hatchings indicates on the map.

Q. Well, what is beyond the cross-hatchings, indicated in red and yellow?

A. There?

Q. Yes. That represents a vein doesn't it? *A.* Going north——

A. Yes, sir.

Q. Is there any line of demarcation at this point between the red and the yellow? Does that indicate a fault?

A. It indicates a fault, yes, sir.

Q. But no displacement?

A. Or a fissure,—which would be the same.

Q. I am simply trying to get at a technical question. Do you intend to represent this as all ore, not having been stoped, or being still in place?

A. As all vein, Judge.

Q. Well, if it is not stoped, how can you tell? Is that
39 forced into the cross section?

A. Those are points that the experts will bring out I suppose.

Q. Oh, excuse me. Let us look at Exhibit B a minute? Well the spaces indicated on this map here, is this all one stope or more than one stope.

A. It is more than one stope.

Q. Where is the line of demarcation between then?

A. I have not drawn a line of demarcation between them.

Q. Well it is in the stope then?

A. No, Judge, it is not.

Q. It is not?

A. No, Judge.

Q. Well, how am I to tell in looking at that map where one stope ends and another begins?

A. You can tell by the section—through D — T.

Q. I will have to go to the section?

A. Yes, sir.

Q. Just turn to that section?

A. (Witness indicating.)

Q. Now tell me where the break is in that stope?

—. (Witness indicating.)

Q. Now tell me where the break is in that stope; where one stope ends and the other begins?

A. Where the stope of the West End vein ends is shown in the termination of the red against the yellow.

Q. And then if the McNamara stope comes up against it, is there any line or demarcation to indicate they are separate stopes?

A. That is a matter of vein structure that the experts will tell you about.

Q. Oh, the experts will have to tackle that, then. Well, your system of numbering—you commence a new hundred with each level,—for instance, the numbers on your two hundred level
40 commence with two hundred and three hundred with three hundred and on the four hundred with four hundred; is that your system?

A. Of numbering the stations Judge?

Q. Yes.

A. Yes, sir.

Q. You follow that system throughout?

A. Yes, sir.

Q. We have endeavored to follow the same system in our maps that you people have so that there won't be very much difficulty in getting at it.

Mr. Dickson: That is all.

Mr. Lindley: I suppose that the exhibits may be introduced in evidence, of course. subject to our objection?

Mr. Dickson: This cross section may be known as Exhibit G.

Redirect examination.

Mr. Dickson:

Q. Is there anything being projected, to your knowledge, to the plane of one of these sections, so far as the geology represented on each of those sections is concerned?

Mr. Lindley: Well, he says that he is not responsible for the geology.

Mr. Dickson: Well, maybe that is so.

Q. Have you projected anything except workings to the plane of the section.

A. I have not.

41 Q. Are you able to say whether or not the cross sections were taken, or intended to be taken at right angles to the strike of the vein, at the place where the cross section was?

A. In a general way they were.

Q. One word about certain cross *examination*—and referring to the upper vein in Red near the west end of the stope on the south dipping vein, we find the figures 586-445-W. 440; 440;—I understood you to say to Mr. Lindley that that was what you understood to be the south vein, so-called. Do you know of a certain agreement or paper that was signed between the two contending companies along about the latter part of December, 1912, in which the south vein was referred to?

A. I do.

Q. Well, at that time, at the time that paper was executed, was the workings in this upper vein, in which we find the figures in my former question that I have just repeated, had that work been done at that time?

A. It had.

Q. It had been done?

A. The winze partially. Winze 440 had been sunk and the drift 409 had been run.

Q. What else had been done at that time on that upper vein?

A. And the workings marked W-44—if it had been done.

Q. What else.

A. Drift 445; raise 586.

Q. Not marked raise; just 586 on this model. What else?

A. I could not remember anything further than that.

The Court:

Q. Mr. Richardson, from where you are standing where is south?
A. I am facing north, Judge, now. This is north.
42 Q. Is there any reason why the model should not be placed so as to conform to the directions in the region where we are?
A. I think that is a good suggestion, we can try it.

(Witness readjusting model.)

Mr. Dickson: Is that about right now?
A. Yes, sir.

Mr. Peck: The disputed territory is away from the court now.
Mr. Dickson: You can get a better view looking at it from the east end of it.

Mr. Lindley: Have you got that properly oriented so that the red vein dips to the south?
A. Yes, sir, that is correct now.

(At this time an adjournment was taken until this afternoon Tuesday, December 8th, 1914, at two o'clock P. M.)

43 Afternoon Session.

December 8th, 1914—2 o'clock p. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.
Mr. Dickson: Just a moment, if the Court please. I will have this map marked Exhibit "H."
(The map so marked.)
Mr. Dickson: Mr. Richardson.

Testimony of WARREN V. RICHARDSON, whom being recalled herein as a witness on behalf of the Defendant, testified as follows, to wit:—

Direct examination.

Mr. Dickson:

(Q.) Directing your attention to the map, Defendant's Exhibit H, I will ask you what that is?
A. That is a map, a composite map of the West End workings.
Q. Of the 2, 3, 4, 5, and 6 levels of which you have level sheets already referred to?
A. Yes.
Q. And of the works connecting from one level to another, I take it?
A. Yes.
Q. What is the color of the 200 level on this exhibit H?
A. The 200 level is colored pink.
Q. And the 300?
A. The 300 yellow.
44 Q. The 4?

A. Green?
Q. And five?
A. Orange.
Q. Orange, did you say?
A. Yes.
Q. And the six?
A. Violet.
Q. I do not see that you have indicated on that map the claims through which the cross sections were taken?

Mr. Lindley: I would like to suggest, Mr. Dickson, that I would like to have the plane of this cross section marked on the map so we can see the relative position to each other.
Mr. Dickson: Yes, I want that on there. I had not noticed it was not there.
The Witness: They are on in pencil, but they have not been linked in, Judge.

Q. Well, take the map this evening when Court adjourns and put these lines upon the map so they will appear distinctly. One other question about the model. Will you give to the Court the angle of the dip of the south dipping vein, the average angle of dip of the south dipping vein from its top, shown in red upon this model. "Exhibit A" down to the foot of what is marked on the model "W" 664; I suppose that means winze 664, doesn't it?
A. Yes.
Q. From the top, then, down to the bottom of winze 664 give the average dip and the distance?
A. I will have to get a scale.
Q. You ought to have had a scale with you. I will correct the latter part of that question, instead of saying down to the bottom of winze 664, down to the end of the red, near the bottom of 664. It has been suggested to me that you take cross section "D," and you can get that much more quickly, Mr. Richardson.
A. Yes. Would be between 30 and 35 degrees.
Q. And the distance? Scale it here, if it is shown upon this.
A. It does not show the winze.
Q. Well, go to the model, then. Give up approximately, not accurately, a few feet one way or the other.
A. About a thousand and thirty feet.
Q. Are you sure about that? Have you made a mistake about that? I did not think it was that much.
A. I will check it. 1040 feet.
Q. How much?
A. 1040 feet.
Q. Now, give the average dip near the West End of that south dipping vein, as shown on section A of Exhibit G?

Mr. Lindley: May I get the points from which he calculated that declination?
(Mr. Dickson indicates.)

Mr. Lindley: The top from which he starts the measurement is in the MacNamara ground?

Mr. Dickson: That is very true.

Mr. Dickson:

(Q.) Now, you have in mind the last question, give the average dip of the south dipping vein, or West End vein, as is shown upon Section A of Exhibit G? The average dip first?

A. About 17 degrees.

Q. And the distance from the top to the bottom of the West End vein as shown upon that section?

A. 895 feet.

Q. Now, the territory through which that section that it is taken is within the limits of the injunctional order that was issued in April or May of this year, is it not?

46 A. No.

Q. And no work has been prosecuted to the deep on the portion of the vein through which that section was passed since that injunctional order was issued by the West End Company?

A. Why, inadvertently they went over the line there.

Q. I mean down at the bottom part?

A. No.

Q. Measured along the northerly side line of the West End claim, do you know what the distance is from the east end line to the point where the south dipping vein at its apex and on its course crosses the northerly side line of the West End claim, if at all?

Mr. Lindley: I wish to interpose an objection there that he assumes an apex.

Mr. Dickson: Well, what we claim to be the apex.

Mr. Lindley: I think we had better define that very clearly.

Mr. Dickson: I can meet that objection.

Mr. Lindley: You can take arbitrary dips at any points and designate the points but I do not think you can have the witness here say that it is an apex.

Mr. Dickson: What the Defendant claims to be the apex.

Mr. Lindley: Well, he may not know. It seems to me that is for the Court to determine. You may take your dip lines from any point and use that in argument that that is the apex, not proving that it is an apex. My objection to the question is that it assumes a fact that the witness don't know.

(Further discussion by Counsel.)

Mr. Dickson: I think that I will reframe the question so as
47 to meet one objection of the gentleman, and then I think it is proper. I will take a ruling on it.

Q. Do you know what is claimed by the Defendant in this case to be the top or apex of the West End south dipping vein?

A. I do.

Q. Can you tell what the distance is from the east end line of the West End claim, measured along the northerly side line of the claim to the point where, if at all, the top or apex, or what the Defendant

claims to be the top or apex of the West End or south dipping vein crosses the northerly side line of the West End claim?

A. I can.

Q. What is the distance?

A. It is about 1,142½ feet from the east end line of the West End claim, measured along the north side line of the West End claim.

Mr. Dickson: That is all.

48 Cross-examination.

Mr. Lindley:

Q. What do you understand is claimed by the defendant in this case to be the apex of the vein?

A. I understand the top of the West End vein to be claimed as the apex of the West End vein.

Q. Where is the top?

A. The top would be the highest point where the trace of a line in a horizontal plane would cross the side line of the West End claim.

Q. Please point that out on the model and designate it by number?

A. It is not shown; the exact point is not shown here because it comes outside of the workings, as excavated.

Q. Well you pointed your pencil at that time to what purports to be a black line running to a stope. That line is what?

A. That line represents the side line between the West End and McNamara lode.

Q. Is it your idea that the claim of the defendant in this case is that the highest follows from the low up to where the model indicates a change in erection, in the opposite way, is the top of apex of the vein; is that it? That is where the vein ceases to have a course downward or upward?

A. Where the West End vein ceases to have a course upward.

Q. Yes. That is what you understand as the claim of the defendant in this case?

A. I do.

Q. The line of demarcation which is shown on your model here immediately north of figure 152 represents what you understand is claimed to be the apex or line of demarcation between the red and yellow?

A. As near as we can represent it on the model.

49 Q. What is there in the ground to indicate a difference between the roll to the south, or dip to the south and the dip to the north? Any physical interruption?

A. I am not prepared to testify on that, Judge; in my calculation I have taken the highest point of the West End vein.

Q. Well assuming that instead of being two veins that is an anticline, you take the axis of the anticline as representing the apex. Is that correct?

A. If it were, I would yes sir.

Q. Your idea is that they are claiming the axis of the anticline as the termination of the West End vein, on its upward course, and

the commencement of the McNamara vein on its downward course?

A. Not necessarily.

Q. Not necessarily?

A. No.

Q. Well, explain?

A. I would have to go into the structural features of the two veins in order to do that, and I am not prepared to testify as to the structural features.

Q. Well, then, we will drop that. According to your notion then, and as embodied in the question of counsel for the defendant,—the top of this so-called West End vein, at the west terminus of it, is in the McNamara ground?

A. It is, beyond the west from the point where the line of apex crosses the side line.

Q. Where does that line, that line of claimed apex cross the side line, is it shown on that model?

A. It is not, Judge; unfortunately it is impossible to represent it as it falls in space.

Q. In what?

A. It falls in space.

Q. Isn't it a matter of fact that all of your model is in space? Does it represent anything but space?

A. The work in solid represents excavation, the space rep-
50 sents solid.

Q. This point where this apex crosses the side line on the northerly side line of the West End, is not marked on that model?

A. It is not.

Q. Well how do you calculate where it is? Is it marked on your map?

A. No, I have not marked it.

Q. Then you measure from the extreme east end of the mine up to a point which you assume to be a place where the West End vein terminates, on its upward extention?

A. I worked it out from a stope plan and a plan of the West End and McNamara lodes.

Q. You have been in these stopes both the McNamara and West End, and followed that vein on the roll from the West End over into the McNamara ground, have you not?

A. I have followed from the West End vein to the McNamara workings, through the top where they connected, as shown in the model.

Q. Isn't that all one stope in the McNamara ground indicated in the red and yellow?

A. They could be considered as one stope or two stopes.

51 Q. How long have you been familiar with this ground?

A. With the workings, do you refer to the workings of the West End MacNamara?

Q. Yes sir.

A. Since March or April, 1905.

Q. March or April, 1905. You were in the employ at one time of the MacNamara Company, were you not?

A. I was in the employ of the MacNamara and West End Companies at the same time.

Q. Do you recall the fact that there was litigation between the West End and the MacNamara company at one time?

A. I do.

Q. Were you employed by either company at that time in connection with that litigation?

A. By both companies.

Q. By both companies. Was there any discussion at that time as to the position of that apex?

A. There was.

Q. Did you reach any conclusion at that time as to the apex?

A. I did not.

Q. Did not. How is this vein which you now call the West End vein been usually designated by the West End Company prior to the commencement of this litigation?

A. I could not say, Judge, that it was ever designated officially. It is called the main vein.

Q. Did you ever hear it called by the West End Company the MacNamara vein?

A. I have often heard it called that.

Q. By the West End Company?

A. Not by the West End Company.

Mr. Dickson:

(Q.) I can not hear.

52 A. Not by the West End Company.

Mr. Lindley:

Q. Well, by officers and agents of the West End Company?

A. No.

Q. Were you employed by either the West End Company or the MacNamara Company at the time of the making of a contract with regard to the south vein?

A. I was in the employ of the West End Company at the time.

Q. You recollect that circumstance, do you not?

A. I am not familiar with the details, but I recollect the circumstance.

Q. Do you know how this vein that you now call the West End vein was designated in that contract between the parties?

Mr. Dickson: That will speak for itself, that contract will, I suppose.

Mr. Lindley: I am asking the witness if he knows.

Mr. Alling: Well, if the Court please, it does not appear that he knows anything about the contract. He knows about the incident; it is not shown that he knows the contents of the contract.

The Court: The objection is overruled. He can say whether he knows or not. That can be answered yes or no.

A. Yes.

Mr. Lindley:

(Q.) You do know. What was it called?

A. South vein in the contract, although I do not know whether the south vein referred to the entire West End vein, or to just the portion that the agreement was on.

Q. Well, you do not know, then, what that—I suppose the agreement will speak for itself. Your calculation as to the dip of this vein is based upon the assumption that there are two veins
53 there, is that it, the West End and the MacNamara?

A. Do you mean, Judge, the dip in the West End ground of this vein?

Q. I am speaking of the vein as a whole, the two veins considered. Do you consider that part of the MacNamara and that part of the West End vein as two veins in your testimony as giving the dip of that vein on the highest point, on the upward point of that vein? You call that a dip because you say that is from the apex, and therefore you must consider—do you consider that if that vein was the only vein and simply rolled over into the MacNamara that your designation of the dip, your explanation of the dip would be the explanation of the dip of that vein as a whole?

A. Well, I was considering it entirely as being the dip of what I considered to be the West End vein.

Q. And considering that that was the end of the West end vein?

A. Yes.

Q. The top was the end of the West End vein?

A. Yes.

Q. And if it should turn out to be the fact that it is all one vein, the yellow and the red, why, of course, your dip would not respond to the dip of the vein as a whole?

A. Well, one dips northerly and the other dips southerly. It is hard to consider that.

Q. Well, I understand your explanation is based upon the proposition that the highest point that you have reached from the bottom workings going upwards was the apex, and that you had figured the dip from that point down?

54 A. That is right.

Q. That is correct, is it?

A. That is correct.

Q. And the value of your testimony, I suppose, will depend upon whether your assumption was correct that that is an apex?

Mr. Dickson: That is a question for the Court to determine and not for the witness.

Mr. Lindley: I imagine that is true, Judge. That is all.

Testimony of WALTER H. WILEY, who, being called and duly sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is your full name and age, Mr. Wiley?

A. Walter H. Wiley.

Mr. Lindley: May it please the Court and Counsel, it affords me great pleasure to recognize Mr. Wiley as a competent expert.

Mr. Dickson: I want to show his experience briefly.

Mr. Lindley: I have no doubt of that, but you cannot prevent me from making that courteous suggestion.

The Witness: My age is 52.

Mr. Dickson:

Q. And where do you reside?

A. In Los Angeles.

55 Q. What is your business or profession, Mr. Wiley?

A. That of a mining engineer.

Q. Where, if at all, what school of mines did you study your profession or graduate from?

A. I first studied mining as a miner. My work as a miner was begun thirty-five years ago. In 1883 I graduated from the Colorado State School of Mines as a Mining Engineer.

Q. Prior to your entering the college or that School of mines, for how long a time had you followed the business of mining, or as a miner, or whatever you call it?

A. As stated, I begun my first work thirty-five years ago. And worked some as a miner then and during the summers while attending the State School of mines, and after graduation.

Q. And when did you say that you graduated?

A. In 1883.

Q. How continuously, if at all, since that time have you followed your profession as mining Engineer?

A. For a few years after graduation I worked as a Assayer and Surveyor. After that I worked as a mining Engineer and have been continuously engaged as such down to the present time.

Q. State in a general way how you have been engaged during that period in your profession, examining mines, reporting on mines or having charge of the operation of mines—generally.

A. My work during this time has largely been the examination of mines for economic purposes, for the valuation for prospective purchasers, the direction of operations to discover ore, or the determination of the nature of the veins or deposits. During that time my work has extended into the greater portion of the United States including portions of Alaska, into British Columbia, and the Yukon Territory. And into a number of the States of Mexico, and

56 into South America and Asia.

Q. And did you mention Colorado, Montana and Idaho?

A. In Colorado I have had a great deal of work. More than in any other one State.

Q. And has your business or the pursuit of your business carried you into Montana, the mines of Montana, any of them and Idaho?

A. It has a great deal into Montana.

Q. The examination of mines also?

A. Into nearly all of the Western states.

Q. What mines—mention a few if any of the principal ofnes if any that you have had charge of the operating work?

A. I have not been a mine manager except in a small way in Colorado. Mines a half a dozen in Clear Creek County. I have examined a great many mines to advise as to the development in the search for ore in different portions of the United States and some in other countries.

Q. Have you made an examination of the West End Mining company, its workings beneath the surface of the West End Mining Claim as depicted upon the maps that have been referred to heretofore, and of the workings of the West End company extending beyond the southerly boundary?

A. I have.

Q. When did you make your first examination of that region?

A. Immediate West End Claim about a year ago.

Q. I will ask you if your examination was directed in part to determining to your own satisfaction or forming a conclusion or judgment to your own satisfaction, as to what strike, dip or the top or apex of the vein, shown upon the model, Exhibit A was?

A. It was.

Q. How long a time in all have you spent in such an examination for the purpose of such a determination?

57 A. Around a month, about thirty days.

Q. At different periods?

A. At three different times.

Q. And have you reached a conclusion Mr. Wiley, as to what the strike dip, top, or apex of the veins claimed veins shown upon the model in red are?

A. I have.

Q. Now, without further questions it will save time, be more satisfactory to the court, and all concerned I wish you would in your own way using the model where you can best illustrate what you desire to convey to the court, and the maps or cross sections where you can make your illustrations clearer by the use of those and in your own way state the result of your examination, your observations, directed to this question of the strike, dip, top and so on, and when you have concluded state to the court what your conclusion is, as to the strike and the top of this vein or deposit, shown in this model in red.

58 A. To begin at the logical place, the surface, I think the appearance of Defendant's exhibit A, the skeleton model, needs an explanation to account for the lack of workings near the surface. This is due to the fact that the veins do not exist there; they do not come to the surface because there has been a flow of eruptive rocks which has buried the vein. Over this immediate area there have apparently been two flows, one which is termed the andesite cap, and is represented by the light green, and the other which is called Brougher, or Brougher dacite cap, appears to have been a flow coming from the volcanic eruption called Mt. Brougher, and the eruptive rock flowed over the top of the previously existing andesite cap, and still deeper buried the veins beneath, so that the only

workings which show, are the vertical shafts, with the exception of a few raises which have been put up below the cap.

The effect of this is that there is no outcrop; the highest point in this vein, instead of being at the surface is deeply beneath the surface and the depth on the top beneath the surface is a varying line, shallowest at the west end, and deepening as we approach the eastern end of the West End claim.

The eastern end of the West End claim or south dipping vein contains a series of stopes, these stopes extending not only up to the end line but to the east of that end line in the adjacent property of the Tonopah Mining Company; these stopes are represented by the blocks of wood carved as nearly as possible to the exact shape of the stopes, show that they are a bond, a body of ore having a definite dip downward to the south and a definite strike easterly and westerly, essentially parallel to the side lines of the West End claim; The dip is not regular throughout, although for a distance of about five hundred feet it is unusually regular, even for fisure veins; as we go toward the west we find an interruption in these stopes, a certain section in the center where the stopes do not extend deep down; this is partly and perhaps largely due to the fact that there has been no mining development in depth; it is by no means certain that the entire vein has been worked in that section; on the other hand I fully believe that there are extensive bodies of ore in this portion at depth; and a proof of one of the reasons for this absence of work and the absence of stopes toward the surface is the fact that this portion, like all other portions of Tonopah, with which I am familiar, this portion has been extensively dislocated by faults.

Mr. Dickson:

Q. Just state what you mean by this portion?

A. The portion of the West End Claim in that vicinity of which I am now speaking. These faults run in different directions; some of them are shown upon this model by the blue coloring, but there are a great many which are not shown; there are many small fractures, slight displacements, which are encountered in working the stopes, but it would be difficult, possibly an impossible matter to show them all upon this exhibit. They are of no especial importance to the miner, as long as they do not materially displace his ore body; the throw upon most of these veins, in other words, is less than the width of the vein, so that there is no interruption in the continuity of the vein by these faults; on the other hand there are some of considerable displacement, and these do interrupt the continuity of the vein.

Q. And are those shown upon the model?

A. These are shown upon the model where they can be shown, for instance this work above the fourth level marked 490 and colored blue is marked as the Edwards Fault, a fault which extends without interruption a considerable distance in a northeasterly direction across the workings beneath the West End

claim; following up since we cannot follow from the surface outcrop down, I will follow up from the deeper workings of the West End, or south dipping vein.

At a point a short distance below the four hundred foot level we reach a change. Following up through the stopes we reach the upper end of the stope and a short distance above that we find a termination as we ascend all this southerly dipping, this West End main vein, against a plane which is represented by the yellow coloring upon this model, and is called north dipping vein, because it dips in a northerly direction.

Q. Let me make a suggestion for the record, that whenever you can you indicate on the model where it is.

A. The point to which I am now pointing is the eastern end of the West End claim, at a point in raise 569 immediately beneath the raise marked 488,—raise 569 is upon the West End claim. Raise 488 is upon the northerly dipping vein. The quartz which is largely the filling of all the veins is similar in appearance no matter from what vein it comes; there are minor differences in different veins, and there are differences in different portions of the same vein, and, broadly speaking, the quartz is the same, or at least similar in the different veins, so that the manner of determining to which vein the quartz filling belongs, is largely a question of its structure; in this case, a question of its dip. We follow up on a vein which plainly dips to the south and we abruptly reach a point where the quartz is cut off by a vein with quartz which dips to the north; the
61 northerly dipping vein has been developed by a series of raises, from 488 in a westerly direction, for about four hundred feet to a raise marked 7-A by raises which are marked 2-A, 4-A, 5-A, 6-A and 7-A. There we have a series of raises dipping to the north and extending to the south, above the top of the West End south dipping vein; they have been driven up upon plain vein filling quartz, usually of little commercial value, although in places there is rich ore.

Q. In place?

A. In place in the raises.

Q. Has it the appearance of being ore in place as distinguished from what is called drag ore?

A. It is ore deposited in the fissure in the place it is now found; there is the appearance in many instances of what has been termed drag ore, and by that I mean ore which is not in place where it was originally deposited, but which has been moved from that place by the faulting; the quartz by this movement is naturally broken, often rounded.

Q. Is that true of these raises?

A. That is true in many places, not only in the mine wherever these faults occur; it is true that you are liable to find some of this drag ore; in these raises there is near the bottom of the raises, near the top of the two veins,—especially near the top of the south dipping vein—some of this broken quartz which is drag ore, but as you go up the raises and get away from this line of faulting the ore is solidly in place where it has been deposited; it is banded in many

places filling the fissures; by that I mean lying in distinct layers; especially is that true in the first raise, 488. The most easterly raise, No. 569, has been extended under this upper portion of the north dipping vein in many cases by flat raises which dip slightly to the north; in section 569, raise 537, where I now hold my
62 pointer, shows this condition, so that you can pass upward from the south dipping vein, come up in quartz and meet quartz, similar quartz, in a series of workings flatly dipping towards the north. You would follow from the vein quartz of the south dipping vein into the vein quartz of the north dipping vein without interruption; there is the appearance of passing from one vein, of following one vein continuously in those workings. This is largely due to the fact that we have here what has been called a replacement vein. By that I mean that the original fissure through which doubtless the mineralizing solutions came, has been materially enlarged by dissolving the adjacent country rock, and replacing it with quartz. The hanging walls of both these veins are fairly well defined, in many cases smooth and very well defined. The foot wall is rarely well defined; the replacement has extended largely from the fissures along the hanging wall into the foot wall; there has been besides the fissuring in the two directions a fissuring of the under-lying ground beneath the top of the two fissures, often in a direction directly opposite to that in the veins; that is, when the strike of the vein is easterly and westerly, the direction of these fissures beneath their tops are northerly and southerly; this fissuring which extends from the hanging wall of the northerly dipping vein often extends downward to a considerable distance; in some cases as much as one hundred feet away from the top of the vein, and large bodies of quartz are found beneath the summit, if I may use that term, of the two veins.

63 The result of that is, necessarily, that mine workings can be made following up upon the true dip, of one vein, and at any point within a reasonable distance of the summit beneath the two veins a working can be made in almost any direction in quartz. It can go up or it can go down. But at some point it will reach the hanging wall portion or the true vein which dips towards the north so that we have continuous working from one vein in quartz, a more or less horizontal working in quartz, and another working dipping in the opposite direction, all in quartz, all in veins.

There is another working known as 571 only about 25 feet to the west of the raise known as the 573. It is merely a duplication of the work following the West End south vein up to its top beneath the northerly dipping vein.

We have another working known as 573, another one known as 575, and a very complicated condition from this point toward the west.

Mr. Dickson:

(Q.) Which point?

A. From this point at 575 towards the west, due to the fact that

the sili-fication and mineralization beneath the two veins is especially prominent at that point, and there has been stopes made upon both of the veins, through this section.

As a general proposition in this eastern end of the mine the stopes are confined to the West End, the south dipping vein. There are no stopes in the north dipping vein in this section. It has a much poorer and very inferior vein indeed in this section as com-
64 pared with the main West End south dipping vein. But there are a few stopes near the top, and of course, as we go further to the west in this north dipping vein, there are large stopes. But in the portion towards the east end of the claim, one of the marked differences of these two veins is that the West End contains large bodies of ore, and so far as developed the north dipping vein is barren.

Q. It is barren for commercial purpose?

A. It has no ore which would pay. The north dipping has followed up in these raises from 488 to 7 A has not in every case been followed to its upward termination. For instance, 488 shown by the green coloring, the cap, and we know that the vein does not extend into the cap, but the lower line of this cap has an extremely irregular, warped surface, corresponding, doubtless, to what was the surface of the ground ages ago, when this eruptive rock came over it probably as irregular a surface as would be formed to-day if there were now a volcanic eruption and the surface buried beneath it.

In one of the raises, five A, for instance, we find however, after going up about 70 feet, we reach a point where there has been a slight faulting and the vein there is terminated by the cap. So that in that case, we have the real apex of the north dipping vein. The real apex of the south dipping vein, as I see it, is the termination of that vein beneath the north dipping vein, and the fact that the north dipping vein continues uninterruptedly above this apex necessitates, in my opinion, the belief that they are separate and distinct veins.

As we go way to the west, the western end of the claim, we
65 have a somewhat different condition. We have a stope such as is shown on Section D of Exhibit G on the cross section, which comes up — evidently good bodies of ore have been extracted on the north dipping vein, the MacNamara vein. And in doing that development, they reached a point where the stopes themselves turned and dipped in a northerly direction.

Mr. Lindley:

(Q.) Northerly?

A. In a southerly direction. If there were no developments in this mine except this stope, without the raises which have recently been made above it, I would candidly be of the opinion that this stope was upon one vein, and that it had turned from its northerly dip to a southerly dip. It is an instance, which we often meet, where limited development does not prove the facts; where extended development is often necessary to determine real conditions.

At this point there is a raise called A. That is a recent develop-

ment, and it shows a similar condition existing in this portion of the mine to that in the eastern portion, as shown by the 2 A to the 7 A raise. That is a fact that while the stope strongly indicated before this raise was made the turning of the vein, this raise A has shown that the northerly dipping vein does, in reality, continue above the southerly dipping vein, and instead of being one vein that they are separate and distinct. It necessarily follows that if two veins run toward each other, either on a level or on a dip, that at some point they must meet. And this is the exact spot where the walls of these two veins meet, that is, the wal- near the hanging wall of the southerly dipping vein meets the northerly dipping vein, not at its
66 highest point, as shown by raise A, but at a point beneath so that we have one continuous stope, in my judgment.

Mr. Dickson:

(Q.) What have you in that raise A?

A. Raise A follows up upon a body of quartz, not as good quartz as in the stopes below. The quartz having some values but not paying ore. Possibly the nature of the filling in these raises I could illustrate by just a few samples.

The sample of quartz marked "I W" which I now show, came from the most eastern of what we termed the "A" raises. That is raise 2 A at a point 66 feet from its bottom. That is, at a point 66 feet above the leading point of the southerly and northerly dipping raise. It is quartz, not rich ore, but contains some black silver sulphides which give it an appreciable value.

Q. Mr. Wiley, are they marked on the rock itself?

A. They are marked with numbers which I will mention. The next sample, marked "2 W" came from raise 4 A. There is no raise 3 A. These numbers were doubtless given with the idea that there might be an intervening raise. So that raise 4 A is the next raise to the west of 2 A. It came from a point 35 feet agove the bottom of the raise, about the point marked where the letter A upon that raise occurs. This is a sample showing argentite or silver sulphide through the quartz, and is rich ore.

Q. I will ask you if both of those samples which you have already presented were taken from rock in place within the deposit?

A. They were taken by myself from the points indicated in these raises from rock in place. Sample No. 3 W came from the
67 next raise to the west.

Q. Give the number, will you, please?

A. That is 5 A. From a point 54 feet above the bottom of the raise. It is quartz with some mineralization through it, but is not good ore. Samples No. 4 W came from raise 8 in the western part of the mine, above the MacNamara stope. From a point 23 feet up that raise. It shows the quartz in that section. It is not ore.

Q. These last two, also, were taken from rock in place?

A. All of these samples are from rock in place in the raises at the point indicated. The vein filling, as deposited in that vein, and at the heights mentioned above the bottom of those raises. These sam-

ples—not these by themselves, but in connection with the observed conditions in the ground—show that there is a strong vein continuing upward and over the top of the southerly dipping vein, and that is is the upper continuation of the northerly dipping vein. There are a number of complications——

Q. Before you leave the raises, Mr. Wiley, I invite your attention to what I take to be a raise in the working shown upon this Exhibit A somewhat easterly of the east end line of the West End claim. Have you anything to say about that? Have you been up that?

A. I have. In connection with that, I will explain that the stopes, as the model plainly shows, which have a dip to the south on the main West End vein, as we go to the easterly of the east end of the West End claim into the ground of the Tonopah Mining Company, have a rather peculiar dip. They dip in an easterly direction similar to that of the West End, but also—in a southerly direc-
68 tion similar to that of the stopes of the West End, but they also are apparently turned up, that is, they have a dip towards the west as well as towards the south. There is a fault, I believe, it has been termed the Buried fault, which has interrupted the continuity of those stopes to the east, and at a point still farther to the east and at a higher elevation, we find another stope of the Tonopah Mining Company, now being worked, where we have a stope of considerable size.

Q. Now, Mr. Wiley, that last stope, the one you are now referring to, I will have you initial that in some way.

A. It is at the easterly end of what is marked the 500 level. And the most easterly stope shown upon the entire model. This stope follows a vein upward, having an inclination of some 25 degrees to the south, and a raise has been put up through the overlying trachyte, and at a point higher up on the 400 level of the Tonopah Mining Company there has been drifts run, cutting other veins, which are colored yellow; colored yellow because they have a northerly dip only instead of one vein we have two. In fact, another small one which might make a third. But one of these veins, that which lies farthest to the north, is the largest and strongest vein. It is now being worked and has been developed upon its dip upward for a distance of over 90 feet. This northerly dipping vein is plainly at a higher elevation that the southerly dipping vein, which I believe corresponds to the West End southerly dipping vein, only at a higher elevation, due, doubtless, to the faulting. There we have a more pronounced evidence of the fact, which is shown in the A raises; that is, the fact that the northerly dipping veins extend upward,
69 as they come toward the surface, toward the overlying cap and are at a considerable distance above the tops of the West End vein. The exact top, it is true, of this southerly dipping vein in the Tonopah Mining Company's ground is not determined. It is not developed.

Q. At that place? At the place you now speak of?

A. The top of the stopes is still in ore, and the vein extends higher up than is shown on the model. But it would have to make an extremely abrupt change to ever reach a point, as high as the top of the

northerly dipping vein. And we know that it does not make this abrupt change and come up there because the entire country is cross cut by the cross cut raise through the country rock, trachyte, and by the cross cuts upon the 400 level. So that the top of the Tonopah Mining Company's vein, as developed by this stope, if it extends upward is at some point beneath the 400 level, and therefore at a distance of at least 90 feet, and maybe a great deal more beneath the highest point of the north dipping vein. Now, I spoke of other complications.

Q. Before you go to that, just a question or two here; have you formed an opinion, Mr. Wiley, and what is your opinion, as to whether or not the most easterly stope shown on this model just east of the east end line of the West End is a stope in the same vein as the next stope in red to the west of it, which is shown upon the model at a lower elevation?

A. I believe it to be upon the same vein. I don't know. There is a considerable displacement between the two, but my belief is based upon the fact that it is similar in appearance, and it
70 is the only vein having this dip and direction, and the presence of the fault between the two would easily account for this displacement.

Q. This portion of the work shown on the model has no number or letters here.

A. It is marked 400 level.

Q. Well, that portion of what is marked 400 level is yellow, as I now point, there should be some lettering on it, is that approximately with the strike or diagonal with the strike of what you call the north dipping vein?

A. It is about a north dipping vein. I would not say for certainty that it is upon the same north dipping vein, as shown in the yellow lower down.

Q. And immediately to the west?

A. Yes.

Q. Does that line of work shown in yellow there east of the east end line of the West End claim, whatever vein it may be on, it is driven along the strike of the vein, or not?

A. It is driven along the strike of a northerly dipping vein.

Q. What is your opinion, if you have one, as to whether that is the same north dipping vein, or a part of the same north dipping vein that you have to the west and at the east end line of the West End claim?

A. I feel confident that one of the two northern veins, as shown upon this 400 level, is identical with the main northerly dipping vein called the MacNamara vein. But both, no matter which is correlated with it, is at a much higher elevation and could by no possibility make a fold and bend over and dip in the opposite direction as shown by the red stope.

71 Q. Go ahead.

A. There is a complexity shown at the eastern end of this model by the fact that not only there are numerous cross cuts running out into the hanging wall, but that there is a second series of

red stopes and drifts lying into the hanging wall of the West End vein. These stopes are upon what is called the Fraction vein. The Fraction vein is a branch vein of the main vein, and therefore is naturally given the same coloring. They are two separate and distinct veins in the upper portion of the mine, but on their descent into the earth, they unite and form one and the same vein so that they are given the same red coloring.

This condition is shown possibly clearer upon the cross sections A and B: A being a cross section just to the east of the eastern end line of the West End claim, and B being a cross section just to the west.

In this connection, I would like to say that these cross sections, A, B, C, and D have been made to supplement the information shown upon the model.

Necessarily, the model can show the formation of the workings only, but in that respect it is the best thing, if there were only one, to show the conditions in the ground. But in the solid rock which has not been excavated, the cross sections more clearly will show the continuity as assumed, we will say—to use that term—between workings. By that, I mean that if we have a drift upon a vein at a certain elevation, the cross section may connect that drift by a red line with a drift below, although there is not a working directly connecting those points. In selecting the place for these cross sections, they
72 were located at those points where there were the most workings. They are not taken through any arbitrary direction, nor at any arbitrary distances. Instead of taking one through this central section where there is little development in depth, they were taken, three of them—two of them near the east end. One through the McQuiilan shaft, and another one through the western end where there is almost continuous development on both of the veins.

The direction of the cross sections is substantially that of the dip of the veins, but not exactly. It would be impossible to make one which was upon the dip, because the dip changes especially as we have two veins which have different strikes and we could not make a line at right angles throughtout with those strikes.

Mr. Lindley:

Q. Which two veins have you reference to?

A. The northerly dipping and the southerly dipping, and also the third, the Fraction here. Section A, which is——

The Court: Mr. Wiley, we will take a recess now. This case is continued for fifteen minutes.

Mr. Bailiff, you may declare a recess of Court for that length of time.

(Recess of 15 minutes taken.)

73 The Court: Jim Butler Tonopah Mining Company, a corporation, Plaintiff vs. West End Consolidated Mining Company a corporation, Defendant.

WALTER H. WILIE on the stand for further direct examination by Mr. Dickson:

Mr. Dickson:

Q. Just proceed Mr. Wilie?

A. I was endeavoring to explain the reason for making the four cross sections.

The Court:

Q. Before proceeding will you please state the place crossed by section A and Section B. I think perhaps that was a little confused when you first stated it.

A. I will state it and show upon the model. Cross section A on Exhibit G is taken a little east of the east end line of the West End claim, it is a different section from the other in this way that it is made through a broken line and for this reason it is made through the long cross-cut of the Tonopah Mining Company, where I now lay my pointer, and at a point shown upon all of the plan maps. These lines are marked upon all of the individual level maps, B. C, D, E, & F; all of the lines of cross sections are plainly marked upon these plan maps. This is met at a point nearly above the head of what is known as the Jim Butler winze, for the reason that there is a continuous working going down on the dip of the West End Vein, and it was the desire to show this working upon the map, because by showing this we showed more continuous and complete workings. Section-B cross section B is taken at a point of varying distance from cross section A where I now lay my pointer, because the stopes upon the West End vein are continuous and there are more workings and it is substantially a true dip, or at right angles to the vein.

74 Q. What is its relation to the West End east line?

A. It is taken at a point about one hundred feet west of the east end line of the West End claim.

Mr. Dickson: Turn to the map the level sheets upon which is shown the plane of the sections?

A. Taking the six hundred level and all the other maps are the same, except section A & B are not shown on the two and three hundred, because there are no workings in that area, that being entirely in the cap; but on all the others the line of section are shown by the black broken lines, and are marked on all the exhibits from D, E, F, & G.

Q. Now how far east of the east line of the West End was section A. passed through?

A. Section A. is through a plane parallel to the east end-line of the West end claim, fifteen feet easterly of that line. Section B.——

Mr. Lindley:

Q. One moment, is it parallel throughout?

A. It is parallel throughout the entire width of the West End claim, and at a point above the Jim Butler winze it makes a turn following the line of the winze. Section B. is not parallel to the

line; where it crosses the northerly side line of the claim, it is at a distance of sixty feet.

The Court:

Q. Well that would be the southerly,——

A. Westerly from the northerly side line,—no on the southerly. I can give that better. It is at a distance of sixty feet west of the north east corner of the Eureka claim; that is not drawn as far north as the northerly end line, because there are no workings on this level; on the other map it will be drawn farther to the north; the position of section C, and section D. are plainly shown upon the plan maps; Section C intersects the southerly side line of the West End claim at a distance of two hundred and seventy feet west of the southeast corner of the West End claim. Section D. intersects the same southerly side line of the claim at a distance of
370 feet northeast of the S. W. corner of the claim. Now
75 a word as to projections, the manner of showing them. These workings as shown upon the model are extremely irregular. It is rare that they are the same, mathametical plane, and in order to make the illustration at all complete it is necessary to represent some workings which are not actually cut by the plane of the sections. Take an extreme case Section C, as shown and raise 2-A, and it shows raise 422-A, which is upon the Fraction vein; the position of these workings relative to the line of sections can be seen upon the model. My pointer,—this section cuts through the McQuillan shaft, that was one reason for selecting it, because it had a continuous development from the surface to the base of the model and deeper. My pointer is now lying upon it; it intersects the bottom of winze 422, but as the raise ascends the top of it gets a considerable distance east of the plane of the section, so to follow that we would have had to incline the model. If we followed a mathematical rule of showing only workings actually as cut by the sections, these two raises which are upon the vein would show upon the cross sections simply by a little dot, and the cross sections would be extremely incomplete; there is absolutely nothing to my mind misleading in representing the thing in this way.

Mr. Lindley: The gentleman is making an argument evidently arising out of my cross examination of Mr. Richardson; I admit that you can't always put it all in, but I never raised the question that you had to absolutely adhere to that.

Mr. Dickson: I suggest, if your Honor please, this is not an argument by the witness, but an explanation merely.

A. My endeavor was merely to explain the relation of the cross sections, to the actual conditions in the ground and are the reasons for taking these points. The points were taken without
76 reference to geology. Section three of which I was just speaking, showing the divergency of raise 422-A upon the Fraction vein. Now while upon these cross sections or two veins, and the reason for coloring the Fraction vein and the West End

vein with red are apparent; they are distinctly seen, and they become one vein in depth, and the glancing upward of this one vein as clearly shows upon this cross-section. Section three illustrate the complexity, probably the greatest throw upon the fault in the mine. The precise throw on cross section C is unnoticed, and rather a deduction based upon observation, veins and faults, at the nearest line to the cross section; it is certain that the Fraction vein is faulty and approximately to the extent as shown; the raise 422-A, which is upon this vein is now being extended. Personally I have not seen the extreme top of that raise. I have been up it twice, but I have not been there within a few days and I cannot vouch personally for the extreme top.

Q. How far up should it be?

A. About seventy-five feet, but from there down follows the Fraction vein, and the Fraction vein was extending upward from the top at the time I saw it. Now the position on this cross section of the various formations; at the bottom of this map, Exhibit G, is a series of little rectangles with different colors the conventional signs marked with the colors used both upon the map and upon the model, the green, the dark green color being the Brougher dasite-cap and the lighter green the andesite-cap, and the brown the rhyolite. Then we have a square, a rectangle marked trachyte which is divided in the model, and in the lower portion of this there is a difference, not striking, not to be seen at a distance, but there are marks through them and it is marked glassy phase;
77 that is so marked because in the mine we find two varieties of trachyte, one which is termed glassy trachyte, having more or less distinct banding, both trachyte and therefor- the same coloring is used with this distinction; there are in places to be found the two kinds close together in the vein in one working, but as a rule the glassy trachyte will underlie the main portion of the trachyte body; the red is marked West End vein, south dip vein; the yellow north dip vein, and the blue lines are faults, so there is a record upon the map of the conventional signs that are used.

The lines upon this section A, the upper portion is not colored. We know that it is cap and we have reasons to suppose it goes down approximately to the top of the trachyte, but the mine is not developed in that immediate section, and it has not been colored; but speaking of this at the point where there are workings, the different formations are known, and the continuity between those positions is more or less conjecture, and it may vary considerably in places from the positions marked, because the line which represents the top of the trachyte or the bottom of the cap having been the original surface was extremely varied; perhaps section C. will show it more completely, because we have the McQuillan shaft; we have in that case the Brougher dacite lying further to the west; we have the brougher dacite in the shaft for a short distance represented by the green colors; we have the andesite represented by the yellow, below that we have the trachyte and under that the brown rhyolite, so that we have the four rocks, and if we take the glassy phase, we have the two varieties of trachyte but not five varieties

of rocks; these sections are taken at the different distances, and show not only the vein conditions, the country rock conditions; they show that the eastern end plane is in the trachyte and considerable glassy trachyte on——

[Page 78 of manuscript omitted in original transcript.]

79 Q. 482 and 484?

A. 417 and 484. That whatever vein it may be, and I fully believe it to be the same, as the raise is continuing upward above 484 it reaches the Brougher dasite, or rock which caps so far as we know from there to the surface; so at that point we have the highest point, or point which corresponds to the surface before the capping covered; that is shown upon the model where I now hold my pointer, and the gap of which I spoke as being more or less conjectured is the portion undeveloped between the head of these two raises.

Q. How are they indicated on the model?

A. These raises are all marked upon the model; on account of the red coloring for the geologist they are not so distinct as upon the sections. The raise is marked 417 on the model, and the upper raise is marked 484.

Mr. Lindley:

Q. Do you make any particular designation of that vein?

A. I call it the south or a south branch of the south vein.

Mr. Dickson:

Q. The south dipping vein?

A. Yes. There is another conjectural feature upon this cross section that I would like to mention, because it is not at all certain that in that particular it represents the conditions in the ground. The south vein which follows down that same fault at a point in raise 566, the large stopes are terminated abruptly by a fault.

Q. That is on section D?

A. That is on section D.

Mr. Lindley:

Q. There is a vein that has been discussed between the parties as the south vein occurring at the West End of the workings. Are you now speaking of the south vein, or is it the south dipping vein. I don't want to get them confused. Do you know?

80 A. I don't know of any vein called the south vein, except that the main west end vein has been called——

Q. There is a vein called between the parties in other transactions the south vein?

A. I don't know anything about it.

Q. Then you have no reference to it?

A. I have not.

Q. Very well.

A. I simply call this the south branch of the south vein.

Q. Can't you designate it as the X vein?

A. I can describe it by the workings here, so there will be no possible mistake. It is the vein developed by the 586 stope, winze 440, and raise 440.

Mr. Peck:

Q. What are you designating now Mr. Wiley?

A. I am speaking of this south branch which unites on its dip with the main west or south dipping vein, and which has its apex developed beneath the West End claim, its upward termination against the cap.

81 Mr. Alling:

(Q.) Sometimes called the hanging wall vein?

A. Well, I think that designation, south branch of the main vein certainly describes it.

Mr. Dickson:

(Q.) At the uppermost termination of the branch that you are speaking of, how far does it separate from the main south dipping vein?

A. Nearly or quite 50 feet. Now, I wanted to call attention to this conjectural feature, that the main south dipping vein of the West End in the stopes is terminated at one point in raise 66 by a fault. That the next place where we actually have that vein developed on the level is in cross cut 606, where a raise has been put up, which comes out into considerably higher elevation. Now, I think I should say that I have not seen the top of that raise. I tried to get up there twice, but the air was so bad I could not get in there.

Q. How far did you get?

A. I have been up raise 606 to a point where it is cut, and I have been up about 40 feet above the 600 level on the other branch. But the upper portion of that I have not seen. But there is a section in between which is purely conjectural. It may be higher up or lower down.

Q. What is the distance——

A. The distance horizontally is about 30 feet.

Q. Have you any opinion as to whether the lower portion is the same vein as the one that followed down?

A. Well, I believe that this represents the probable conditions. It represents them to the best of my opinion and belief, but I have no knowledge and belief as to the precise position of that inter-

82 vening section. I only know that there are two faults that have dislocated the vein.

Mr. Lindley: I will state Mr. Wiley isn't it the rule when you put projections on the map, to place dots there to show that they are projections, and not put them in solid?

A. That is often done, sir. When in connection with the sections we had a skeleton model which shows absolutely the positions I think that the map is better if instead of a dot you have a full line.

Especially I think that it is a clearer plainer representation to draw a full line.

Q. It simply confuses the projection with actual demonstration is all.

A. Not in the slightest when the section is accompanied by plan maps showing the lines, and by a model which shows the exact position of all of the works.

Mr. Dickson: If it will be any more satisfactory to the gentlemen on the other side, I will ask permission to introduce that to withdraw that map Exhibit G, and you can indicate on that to-night the amount of the projection wherever there has been any projections, and the direction where the projection took place, east to west or west to east, can you not?

The Witness: It can be marked you cannot very well erase those lines.

Mr. Lindley: The ambar-assment which flows from a situation of that kind is obvious. When the court decides this case he may overlook all about that situation and if his attention is not called to what is projected and what is actually demonstration——

Mr. Dickson: That is what I am asking him if he can illustrate on that map.

Mr. Lindley: It is a rule that I have always seen followed
83 to dot in the projection. It may be perfectly rational and perfectly reasonable, I do not criticise that at this time. I may have something to say about that later, but I made the suggestion on account of the confusing tendency at critical points. You may go on if there are not so many of them I do not think it is worth while, but I am going to ask leave of the court to take these cross-sections this evening and trace them, if counsel has any duplicates to give us.

Mr. Dickson: We have no duplicates, we hadn't the time. If it would be more satisfactory to you I can have Mr. Wiley, wherever there has been any projections to indicate on the map what was projected, and the distance it was projected and the direction.

Mr. Lindley: I do not think that you need do that at present. Now, pardon the interruption Mr. Wiley; you may proceed.

Mr. Dickson: Go ahead.

A. I think that covers the essential points. If you wish something further.

Q. What kind of a vein do you call this south dipping vein?

A. I call it a distinct fissure vein. It has been materially enlarged by replacement, especially replacement of the foot-wall.

Q. What evidence do you find in the south dipping vein from the westerly to the easterly end of an easterly and westerly fissure.

A. We find the fissure developed on its strike for a distance on some levels greater than a thousand feet. We find it developed on its dip for distances greater than eight hundred feet.

84 Q. And what about—withdraw that—what evidences do you have underground of easterly and westerly fissures in this north dipping vein?

A. We have that fissure not so plain, nor so strong as the south dipping fissure, but we have a plainly defined fissure developed by the several levels and raises, and in the western portion of the mine considerable amount of stoping.

Q. That portion of the north dipping vein, westerly portion where the large stopes are shown, state whether or no you find an easterly and westerly fissure?

A. Generally speaking easterly and westerly. The direction of these two fissures is neither of them easterly and westerly and they differ from each other considerably.

Q. The two lines of the fissure, I will ask if they are parallel in their course or if they convergem and if so in what direction are they converging?

A. They converge as they go towards the eastern end of the claim and meet—necessarily meet at a point just near the eastern end of the claim, just the same as the two fissures converge, they come upward and necessarily at some points touch each other.

Q. You spoke of the replacement of the country rock from each of these fissures to some extent, and where they form a junction and for some distance below the intervening foot-wall country of the two fissures, as I understand, has been replaced from one fissure to the other for a distance below the junction?

A. It has to a very considerable extent in places.

Q. Now, aside from that region near, and a short distance below the junction, apart from that, how far, within what limits, have you observed the replacement extend from the south dipping fissure which seems to be the stronger vein of the two?

85 A. The actual ore bodies and stopes have been replaced from the hanging-wall into the foot-wall for a distance of twenty or thirty feet; in a few places more. It is not only a replacement of the vein wall country rock, the actual ore deposited in this section.

Q. In other places how slight a distance has the inclination or replacement extended? How far?

A. The vein is quite irregular in thickness, and in places the vein action has extended back but a few feet.

Q. But has the process of replacement extended into the hanging wall in the south dipping fissure to any extent?

A. Not nearly to the extent to which it has extended into the foot-wall. There are places where the quartz does extend out to the hanging, but they are comparatively few.

Q. And limited in extend as compared with the replacement on the foot-wall side?

A. Quite limited.

Q. Is that also true of the north dipping vein, where you have the big stopes?

A. So far as I have seen them. I have not examined the north dipping vein stopes nearly so much as the south dipping. I have been through many places where they are caved, some of them are entirely closed.

Q. You spoke, Mr. Wiley, of places where the south dipping and

north dipping vein or fissures come together, of there being an abrupt change in the structure from the south dipping course to a north dipping course, will you point out some places where that is most noticeable, so that it can be examined by the experts on the other side, if they desire to examine it.

A. The most easterly raise of all, the nearest to the end line 569, shows that condition very clearly, the south dipping vein coming up at a pitch of around thirty degrees and meeting a sharp
86 plane dipping in the opposite direction, just as plain as the roof of a house dips in the opposite direction.

Q. What is the appearance of the hanging-wall of the north dipping vein at that point as to being smoothe or well defined or illy defined?

A. Well at that particular point the hanging-wall is not disclosed all the way.

Q. Well, can you point to any place where the south dipping and north dipping fissures unite and you have a difference in structure between the two, where you have the hanging-wall of the north dipping fissure disclosed?

A. I would not use the term unite, they meet.

Q. Well, that is what I mean.

A. But the hanging-wall of the south dipping fissure is not as plainly defined as the hanging wall of the north dipping vein. On the north dipping vein the hanging wall is entirely a different wall from that of the main south dipping vein. It is the rule that it is smoothe and well defined, and there is more or less clay often along that wall.

87 Q. More or less what?

A. Clay, a deposited clay, which is common in the south dipping vein, but not so common, as in the north dipping vein.

Q. What is your opinion, if you have reached a conclusion, as to the strike of the south dipping vein, and also of the north dipping vein?

A. The strike of the two veins is best shown by the plan maps of the different levels.

Mr. Lindley: You are speaking of the strike at the top, at what you call the apex on any given level?

Mr. Dickson:

Q. Well, I will say on the 400 and 500 levels, where there is the greatest extent of development in the vein, as I understand. What level is that you have now before you?

A. The 400 level here. The 500 I wish to show it on.

Q. Exhibit what?

A. The 400 level, Exhibit D, shows by the red coloring the south dipping veins. The wider area is upon the main or West End south dipping vein. The irregular, smaller vein to the south is the Fraction vein.

Q. Give some station or marks that are on the map on that Fraction vein.

A. The Fraction vein is marked upon this exhibit, "Fraction vein" and extends through drift 422 W. and 422 N. and drift 422 S.

Q. For what distances is the main south dipping vein, as you call it, easterly and westerly developed on that level?

A. Over 1200 feet.

Q. How much?

A. For a distance greater than 1200 feet. I should like
88 to speak and call attention to the fact, in connection with this, that the apparent splitting, division of the two veins toward the west is also shown upon this. The southern red streak being what I term the south branch of the south vein.

Q. Now, leaving out the south branch of the south dipping vein, a distance,——

A. The distance is greater than 1,200 feet, not including that branch.

Q. Now, I point to the red portion, what is shown in red on this exhibit; that represents the ground being stoped out, I suppose?

A. Not all of it, no. There are stopes through that area but the red coloring upon the plan map is not confined to the stopes.

Q. Has the vein anywhere a width or thickness such as would appear from that picture?

A. It is as shown upon the plan. That is not the true width at right angles to the dip of the vein, and being a very flat vein, the width on the horizontal projection is very considerably magnified.

Q. Now, go to the 500 level. Is the Fraction vein indicated upon that level also?

A. The development upon this level in the Jim Butler mine in the Fraction vein is shown upon this level.

Q. How is it marked?

A. It is marked by the words "Fraction Vein." This particular level also shows very plainly some of the faults, a stepfault which interrupts the continuity of the Fraction vein on the level.

89 Q. You spoke of that as the south branch of the south dipping vein; that is not developed on that level, is it?

A. It is not shown upon this plan map, although it is developed on this level, but at that level it unites with the other vein so that there is only one red streak, necessarily.

Q. Now, go back to the 500; to what extent, in a general easterly and westerly course is the south dipping vein developed on that one level?

A. The extreme distance between the eastern end of the south dipping, vein, as disclosed by the Tonopah Mining Company's stopes, and the extreme western end where it is cut off by the Broughe dacite, even at this depth, is over 1,400 feet. There are interruptions in the continuity, that is, it is broken by the faults. I do not want to have the impression conveyed that it is an uninterrupted, straight vein for 1,400 feet.

Q. Well, where there is any interruption by faulting or otherwise, it is not represented on that exhibit as being continuous, is it?

A. The dislocations by the faults are all shown, where they are of any magnitude, upon this map.

Q. Have you formed an opinion as to whether or no for the distance you have stated that is one vein on that level?

A. It is one vein, or portions of one vein from the extreme eastern to the extreme western ends of the red coloring shown upon this map. The direction of the north dipping vein is best shown upon the plan of the 400. And the divergence in direction of the two is plainly shown upon this map; a difference of about nearly 40 degrees in direction.

90 Mr. Lindley:

Q. What level is that?

A. This is the 400 level. The red coloring upon this map is interrupted also by a fault. The yellow coloring upon this plan of the 400 level is shown as terminating for a distance to the north and to the west. That is due to the interruption by what has been termed the Edwards fault. The vein continues beyond that but, like the south branch, it is interrupted by these faults.

Q. Now, do I understand that on the 400 level, the north dipping vein and the south dipping vein on their course easterly come together?

A. The two veins meet at that point. Necessarily, having a different direction, they meet at some point, and that is the point as shown by the colorings near the east end of the West End claim.

Q. Now, has the vein from there on easterly been developed on that level for any distance?

A. It has been developed only to the extent that is shown upon the model by the work farther to the east in the Tonopath Mining Company ground.

Q. Have you reached a conclusion, Mr. Wylie, as to what is the top or apex of what we have been speaking of, or you have been speaking of, as the south dipping vein?

A. I have.

Q. I wish you would state what your conclusion in that regard is.

A. The apex of the south dipping or main West End vein crosses the eastern end line of the West End claim. This apex is at a considerable distance beneath the surface, due to the fact that all these veins are covered by capping. This apex extends in a west-
91 erly direction beneath the surface of the West End claim for a distance of about 1142 feet, at which distance it crosses the northern sideline of the West End claim into the MacNamara claim. This line is not a mathematical line. It is irregular and broken in places by the faults, as well as by the fact that the cap which came down was not upon a regular descending line. The original erosion surface was an irregular plane. This top in places is beneath this cap, and to a considerable extent, it is beneath the surface or plane of another vein, which dips in a directly opposite direction and extends upward above the summit or top or highest point of the West End south dipping vein.

Q. The other vein that you now refer to is the one that you have been referring heretofore as the north dipping vein?

A. It is. The strike of this south dipping vein is shown by the

levels upon the vein, and is shown to be essentially in an easterly and westerly direction, approximately parallel to the West End claim.

The dip, of the vein is, of course, at right angles to this strike. The true dip, as we go downwards upon the vein being approximately in a southerly direction, more or less parallel to the end lines of the West End claim.

Q. I will ask you whether or not you, among others, directed the coloring that was to be put upon the model to represent different geological features, as well as vein features, and also upon the several maps that have been referred to?

A. The coloring upon all the exhibits was the consensus of opinion of the different persons, and I assisted in suggesting with the others, what colors to use, and assisted in directing what colors should
92 be put upon the different workings to represent the formations which I had seen in those workings.

Q. Do you approve of the coloring that has been adopted to show the different geological features and vein features on all these exhibits?

A. I do.

Q. I thought Mr. Richardson knew more about geology than he does. So I will have you take that model, the maps being the same color scheme that is there, and state what the different colors shown upon the model are intended to represent. You have already spoken of the cap rock, the green and the light green?

A. I think I have mentioned them all, but to repeat, the violet color is trac-ite; the dark brown color is rhyolite; the red coloring represents the south dipping veins or their branches; the yellow color is the north dipping veins; the two greens are the two different cap rocks.

Q. And the blue?

A. The blue shows faults.

Q. Now, I notice particularly on the northerly portion of the workings shown upon this model another color, gray,—I take it to be gray. What is that?

A. The gray or neutral color is where the geology is not put on at all. It represents nothing. In many cases the workings were inaccessible; some of them were beyond the lines and were not accessible.

Q. During your examination or examinations of the underground workings shown upon this model, I will ask you if you visited all of the underground workings that were accessible?

A. I think I have visited all which were accessible. If I
93 have omitted any, it was inadvertence. It is possible there are some, in fact, it is probable some small workings that have been missed or some that I did not get into, especially in the MacNamara, where I tried to get in and found it caved and I might have gotten in in some other way.

Q. But your aim and purpose was to visit all of the openings that were accessible.

A. I have tried to.

Mr. Dickson: If your Honor please, there are a few more questions, perhaps; I do not want to close.

The Witness: I think I should say in connection with that answer that I approve all the coloring upon this model, that there are a few, a very few workings where I don't know. This model has been colored, as I stated, by different persons and there are a few workings I have not personally been in. That is, they are caved and I could not get in, and yet they are colored. For instance, this raise up here is entirely closed (indicating).

Q. Which raise?

A. This raise above the MacNamara stope has no number, but it is directly north of the Porcupine shaft, colored green at the top. That is caved in and I understand has been caved for years, but it is colored on information and knowledge of others.

Q. What other places are there that are colored there that you have not been able to gain access to?

A. Well, the Porcupine shaft, I haven't been there. I have seen it at the top, and I have seen it at these two levels; I have never been entirely through it.

94 Q. Well, are we to understand then that the coloring upon that map—I will change that question. Are we to understand that there are a few places colored, the red or yellow or purple or dark brown which you have not had access to?

A. Yes, a very few.

Q. What is the——

A. There is only one other place I have not spoken of that I might call attention to. This long working on the 300 level is rather interesting. As it runs out from the stopes upon the south dipping vein through the volcanic Brougher dacite to a point where it meets the trachyte underlying vein, the *and* there, on what is known as the California stopes there are workings upon the north dipping vein, which, as we come up on the true dip at right angles to the strike, hit this Brougher dacite and have their top, their highest point, beneath this cap. And there is no south dipping vein at all in that area because of the cap being deep down and extending even as low as the 600 level.

In other words, this area which upon the surface is shown by this slope, is the beginning of Brougher Mountain or volcano extending up, and these workings run into the eruptive rock of the volcano, and there is no vein on the south dipping part; it is cut off much sooner than upon the north dipping part.

Q. Cut off farther to the east?

A. Much sooner as we go toward the west, yes.

Q. Is it your opinion that the termination of this north and south dipping vein is due to that eruptive rock?

A. It is unquestionably due to the Mt. Brougher volcanic eruption.

95 Mr. Lindley: Let me understand that question.

Mr. Dickson: Whether, in his opinion, the cessation of

these two veins is due to the fact that it was cut up by this eruptive rock.

Mr. Lindley: I guess that is obvious.

The Witness: Not only the termination of the vein on its strike is due to that, but the termination of the northerly dipping vein as you go upward upon its dip is also, in places, due to that.

Mr. Lindley:

Q. As an intrusion?

A. Perhaps the term intrusion is correct, but still it is a vast upwelling of the volcano doubtless Brougher Mountain, so that it is of greater magnitude than the ordinary intrusion.

Mr. Dickson:

Q. What is your opinion, Mr. Wylie, as to whether that intrusion or eruption, eruptive rock, has been post-mineral or pre-mineral?

A. It came after the vein, as proved by the fact that the vein terminates and is cut off, and as we drive drifts we go from the ore bodies or from the veins directly into the eruptive rock.

Mr. Lindley:

Q. I would like to ask in reference to this nomenclature, the naming of these rocks. Have you any other name for the Brougher dacite? Has it any other local name by which it is called?

A. I know of none, except the cap, and in as much as the andicite under it is also cap, we, to be explicit and complete, call it the Brougher dacite cap.

Q. Are you familiar with the names given to the rocks in Spurr's monograph?

96 A. I am not familiar. I have read a portion of that.

Q. I simply want to identify those rocks, if I can.

Mr. Dickson: Which names do you refer to, Mr. Lindley? I understand he has given more than one.

Mr. Lindley: Take his last report.

The Witness: The U. S. Geological report, Mr. Lindley, does not use these names which we have used, but I have seen a report, second report of Mr. Spurr's, a part at least of that report, in which he entirely changes the names of the rocks as originally given. And I think that these names agree substantially with the revised edition, the last one by Mr. Spurr, made in 1910.

Q. What rocks do you identify as the Fraction dacite breccia?

A. I think it is the Brougher—Oh, the Fraction dacite. I don't know. The Brougher Mountain dacite.

Q. You do not know whether that classification would bring it within the Brougher Mountain dacite or not?

A. No, I don't know.

Mr. Dickson: I would like to adjourn now, if your Honor please. We are getting along pretty rapidly and I am going to try to speed it as much as possible, and if we could shorten the hours a little,—it is hard work for me; I am getting old.

The Court: Any objection? This case is continued until tomorrow morning at 10 o'clock.

97 3.

December 9th, 1914—ten o'clock a. m.

Testimony of WALTER H. WILEY, resumed.

Direct examination:

Mr. Dickson: You may proceed with the cross examination Mr. Lindley.

Cross-examination.

Mr. Lindley:

Q. Mr. Wilie, as a preliminary to your cross examination upon some of the issues of this case, I would like to straighten out in my own mind your conception of the order of the occurrence of these various rocks and I would like you now to take them in the ascending scale, take the first appearance now under consideration no matter what may be below that. What is the earliest rock that is encountered in this territory; of the earliest geological period?

A. The deepest rock in the ground is the rhyolite.

Q. What relation has the rhyolite, if any, to the vein system?

A. The rhyolite lies in the foot-fall country of the,—well of both veins beneath the veins.

Q. Is that rhyolite the rhyolite that is familiarly called the West End rhyolite?

98 A. It is so termed.

Q. That forms the foot-wall of the vein?

A. In some places.

Q. Does it form the hanging wall in any place?

A. I do not recall seeing it on the hanging-wall side at any point.

Q. Then it is the foot, or forms the foot of the vein country?

A. In places only.

Q. Well, there is a change of formation?

A. There is.

Q. This comes through. Now proceed to the next rock? Your conceptions of this situation was that the rock first laid down so far as this controversy is concerned was the West End rhyolite?

A. It is the deepest rock. Of course the trachyte is found, as deep in other portions, more especially to the east, and I presume that the trachyte was first formed, although I do not know for certain.

Mr. Dickson: The trachyte?

A. The rhyolite was formed first.

Mr. Lindley:

Q. Then what happened?

A. Right above that in many places and at the same elevation, at other levels is the trachyte.

Q. That is second in point of time and overlying the rhyolite.

A. That would be the natural assumption, although not an absolute conclusion.

Q. What is your judgment about it?

A. I really am not enough of a geologist to say. I usually would suppose that the deepest rock came there first, but I understand that in Tonopah that this is sometimes, often in fact, not the case.

Q. This trachyte, which you speak of and according to your belief or judgment is second in period of geological time, is of volcanic flow; that is discharged from a crater of a volcano over-
99 flowing the underlying rhyolite.

A. I do not know its source whether from the crater of a volcano or some large eruptive dyke of some distant source I only know that it is an eruptive rock; it may have come from the surface or may have been intrusive between rocks or andesite.

Q. Well, we have the trachyte then overlying the rhyolite?

A. In places, yes.

Q. To what extent *is* the area involved in this Jim Butler West End McNamara field does that trachyte overlie the rhyolite?

A. In the central section, perhaps a third or a quarter of the area of the length of the West End claim roughly speaking.

Q. Well, next in sequence what rocks do you encounter in the geological order in the ascending series?

A. Above these we have the caps, two different rocks; first what has been called the andesite cap and next on the surface what has been called the Brougher dacite cap.

Q. Is this andesite which you have reference to, frequently referred to as the Midway andesite?

A. I do not know.

Q. Is this classification of rocks in this district in the order of their appearance to which you have testified, have you reached this classification from your own investigation or have you accepted the classification fixed by others?

A. I have investigated myself as to the occurrence of the rock, but the names of the rock, candidly, I will say, personally I do not know whether this trachyte is a trachyte an andesite or some other rock. To determine that would necessitate investigation along the line of petrography, and I have accepted the names which I understand are the last revised names given to these rocks by others who are far more competent than I to name them.

100 Q. By others who do you mean?

A. More especially Mr. Spurr.

Q. Mr. Spurr. In his contributions to the work of the geological survey or upon his report of the mining properties here, or both?

A. I have studied both, but the names which he gives in his professional paper of the geological survey, are not the names which he gave later on in the report made in 1910 on the mines of the district, and the names which are used here agree with the last report.

Q. Well, were those a change in the names any more than a minute classification?

A. I think they were a distinct and extreme change of names.

101 Q. How about the character of the rock?

A. I do not assume the character has changed.

Q. Well I mean the designation?

A. The designation changed materially, yes sir.

Q. You know what is commonly termed the Fraction dacite or breccia in this term?

A. I have heard that term.

Q. And you know the horizon in which it lies?

A. No, I do not. I only know that term was *sued* by Mr. Spur originally for some of the top rocks.

Q. Well, do you identify that what we call the Fraction dacite breccia as being the equivalent in certain areas of what you classify as the Brougher Mountain dacite?

A. I think possibly that is so, although there is so much confusion in my mind as to just what was meant by that, and I am so entirely incompetent personally to give these names to these rocks that I should prefer to answer that I do not know.

Q. Well, I apprehend, Mr. Wiley, that the only purpose of correlating these different names is so that the different witnesses when testifying under different names may be known to be referring to the same thing; I do not understand that there is any particular point in the change of the names that changes the physical condition. You have given us the best that you can with reference to the origin of these rocks and the order of their occurrence?

A. I have.

Q. And the last is the Brougher Mountain dacite?

A. It is.

Q. Is that the rock that overlies the extreme west end of the West End claim?

102 A. It is.

Q. I am going to proceed with this examination, adopting you- theory for the time being for the cross examination, the theory that you have that these two veins terminate abruptly up against something.

A. They do.

Q. What do they terminate against?

A. Against this Brougher Mountain dacite cap.

Q. And nothing is seen of them in that direction any more?

A. Nothing whatever.

Q. With reference to the order of laying down of these rocks when were the veins formed?

A. The veins, I presume, were formed before either of the two cap rocks and after the other rocks.

Q. That is the forming of the trachyte or Brougher Mountain dacite?

A. Before the andesite or dacite, and after the rhyolite and trachyte.

Q. After the rhyolite and trachyte. Aand to some extent, these veins, do you classify them as fissure veins?

A. I do, with the explanation that they have been very materially enlarged afterwards by the replacement of the walls.

Q. That is to say, the mineralization has come afterwards?
A. Yes.
Q. The vein itself has been enlarged?
A. Yes.
Q. In what way?
A. By replacing the walls with quartz from the previously existing fissures.
103 Q. In other words, the mineralization extended into the walls?
A. Yes sir.
Q. The mineralization extended into the walls and replaced the original rock?
A. Yes.
Q. So these veins are replacements?
A. They are replacement fissure veins.
Q. Now I understand you testified that both of these veins in places follow the contact between the two veins?
A. In places they do.
Q. Your idea is that this fissure was created by some dynamic force through some crater or crevice in the earth, regardlesss of the contact and regardless of the direction of the contact?
A. It is, speaking broadly; of course necessarily at times it was not regardless of the contact and in places it is.
Q. To what extent are these two veins found between the two rocks?
A. The south dipping vein, so far as I can say, is more often on the contact, between the rhyolite and trachyte although that may be due largely to the fact that the area of the south dipping vein — much larger than the area of the north dipping vein.
Q. Have you a cross section which shows the contact of the two veins existing in the line of contact?
A. Our cross section "C" of exhibit "G."
104 Q. Now referring to your section "C" we have the two veins there following the same contact?
A. We have the two veins with the rhyolite beneath both, and the trachyte forming the hanging-wall in each instance through the greater portion of the area shown on the section.
Q. Well in that section as it is delineated on that map the two veins occupy the same plane of contact between the underlying and overlying rocks?
A. They do, to the extent that the *extent that the* north vein lies beneath the south dipping vein. As the north vein extends on its course above the south dipping vein it is in trachyte entirely for a ways, above that we have the cap.
Q. It extends beyond the plane of the contact and breaks into the trachyte, that is, the norh dipping vein does?
A. It does.
Q. The south dipping vein adheres to the contact?
A. It does.
Q. Now with reference to the relative age of these two veins which is the older of the two?

A. I don't know for certain, but I know that there are strong indications that the north dipping vein came after the south dipping vein?

Q. Came after?

A. Yes.

Q. What would indicate the difference in time of appearance?

A. The fact that the north dipping vein continues up beyond the south dipping vein and has a smoothe wall continuously through the distance from a point below to a distance above that vein; and that the termination in some places of the south dipping vein is rather abrupt against that vein.

Mr. Dickson:

Q. Against the north vein?

A. Against the north dipping vein.

105 Mr. Lindley:

Q. And it is your idea that in the first instance the north dipping vein was created, the fissure was created and that subsequently some dynamic force created the south dipping vein?

A. There are indications of that.

Mr. Dickson: I understood the witness to say the converse of that, that the south dipping vein was first in time.

The Witness: That is correct.

Mr. Dickson: In the opinion of the witness.

Mr. Lindley:

Q. I intended to put it that way. Is it your idea that the south dipping vein was first formed. Let me before proceeding with that dynamic geology——

A. I want to say, Judge, that I have not stated that as a positive conviction. I have stated it as a probability, in my opinion only. I do not know for sure.

Q. Well, if it was cut off by the north dipping vein, it must have been there to be cut off?

A. There are indications that at those points, it must have been there before, yes.

Q. Then it is your idea, that is to say that you are not going to commit yourself as to that absolutely, I understand Mr. Wiley?

A. That is a very difficuly problem for an ordinary individual to determine.

Q. Well, I would like to ask you if, in your extended experience as you have detailed in here for the benefit of the court, the occurrence that you speak of here of this south dipping vein being cut off by a north dipping vein under the conditions shown here, is a matter of frequent occurrence?

A. Yes, th[illegible] not at all unusual.

Q. Not at all unusual.

A. For one vein to be cut off by another. Extremely common.

106 Q. I would like you to explain what there is to indicate at the point of contact of the two veins, eliminating for the time being the upper extention, to indicate that one is cut off by the other?

A. The fact that the change in dip in some of the raises is extremely abrupt. That as you come up on the south dipping vein for instance, in raise 569 the most easterly of the raises, the raise nearest the end line, you meet a sharp dipping plane in the opposite direction. A clear distinct sharp dipping plane which appears to have cut off the other vein.

Q. Appears to have cut off or appears to have changed the direction of the other vein?

A. In no way changed the direction of the other vein because, of course, I cannot altogether assume your hypothesis of eliminating the upward extention, because you see the upward extention right there. You see it going on above.

Q. That is you see it now?

A. As well as below.

Q. Let me ask you whether in mining that ground the miner has paid any attention to anything above the hanging-wall?

A. There is no pay ore there and the miner has paid no attention that is, he has extracted no ore from above the hanging-wall any more than he has on the north vein in this area below.

Q. As a matter of fact the miner has followed the ore in whichever way it has been?

A. Yes, doubtless endeavored to do so.

Q. When were these upraises which you identify on your model here, 2-A, 4-A, 5-A and 7-A put up?

A. Comparatively recently, I believe. I do not know exactly as some of them were there when I first saw the mine.

Q. Well, they are what you might call litigation work as contradistinguished to work in the immediate progress—in the
107 ordinary progress of developing a mine?

A. I understand that they have been made to determine the facts in the case geologically for the purposes of this suit.

Q. What do those up-raises follow?

A. The- follow upward on the north dipping vein.

Q. Are there any faults in that section of the country?

A. There are a great many faults in this mine.

Q. Well, can you classify them as major or minor faults?

A. Now, as a whole, although I spoke of one the Edwards fault as being one of the most extensive.

Q. Are there any major fault-, that is a controlling factor there that passes through that ground?

A. I don't know. The buried fault is certainly a fault of very considerable displacement; possibly a good deal more than the Edwards fault. But the Edwards fault has been traced for a longer distance a greater depth in this West End mine than any of the others.

Q. Is there any evidence of faulting in connection—where these raises extended?

A. There is evidences of movement, and that movement along the north vein itself.

Q. To what extent along the north vein, where? What part of the north vein?

A. The wall of the north vein has more clay than is usual on the wall of the south vein. Both of theses veins have been lines of faulting. It is the exception that a fissure vein is not more or less a line of faulting, and this leads to the formation of the most conspicuous feature, clay on the wall. There is clay on both of these veins, but there is more on the wall of the north vein than is usual on the wall of the south vein, therefore, I say that there are indications of movement in that immediate section where
108 those raises have been made.

Q. In other words the gouge has that movement?

A. It has.

Q. And do you find that gouge uniformly in the hanging-wall section of the north dipping vein?

A. I wouldn't say uniformly, but we find it over a considerable portion of the work.

Q. In the immediate vicinity of where you say this—where one vein ends and the other begins, is there indication of the gouge between the two veins where they come together?

A. Where the brittle quartz abuts against the britt-e quartz you cannot make a clay out of that and the quartz is crushed and broken without clay.

Q. In other words in the vein there isn't any gouge?

A. The gouge lays on the walls, the hanging-wall in almost every case above the vein.

Q. Well do these walls the foot and hanging of the south dipping and the foot and hanging of the north dipping, break into each other, or is there any line of demarcation, eliminating now out of consideration your raise above; anything to indicate that those two veins now occupy any different position than they originally occupied?

A. They occupy the same fissure which was enlarged by replacement. The amount of movement which may have been caused by this faulting may have been extremely slight in the case of either vein, and not a movement of the fissure vein, cnly local in places.

Q. Is there any drag quartz aroun*f* in that section?

A. There is some drag and rounded quartz.

Q. Where?

A. In both of the veins and where we have more clay there is more liable to be more of the drag quartz and near the head or the point of the meeting of the veins there is in places con-
109 siderable drag quartz. Still further above that there is the plain banded quartz deposited in place.

Q. Now, it is your idea if I understand you, that generally there was a fissuring along the plane of this contact?

A. Well, it happened locally to be there along the plane of the contact.

Q. Well, I am speaking now with reference to the geological section, section "C." This is the — before mineralization I suppose? That contact was created before mineralization?

A. The rocks were there before mineralization, yes.

Q. And the contact was there before mineralization?

A. Certainly, one rock lay on the other.

Q. One rock lay on the other. And that was a contemporaneous proposition? That is to say that contact was formed under the same conditions on both sides?

Mr. Dickson: You mean on both the south dipping and the north dipping vein?

Mr. Lindley: Yes.

A. Under the same conditions, yes.

Q. And that was there before mineralization?

A. It was.

Q. Now what is your theory as to the mineralization of the two veins?

A. The natural and logical one, that having the fissure there the mineral solutions came up through those two fissures and mineralized the two veins.

Q. Passed from one into the other?

A. No, not necessarily. Passed in some cases near head, yes, the mineralization after the second fissure was formed, if they were of different ages, from one into the other for a short distance, a sort of mingling in spots.

110 Q. But the fiss .e was all formed as you have testified to, at the same time, north dipping and south dipping.

A. No, I didn't testify to that. On the contrary I expressed the idea that probably the north dipping fissure was formed after the south.

Q. Well, the contact was formed simultaneously?

A. Certainly.

Q. And both veins follow the contact?

A. They do.

Q. Now with reference to the period of mineralization, and these openings were there *n*efore mineralization, along that contact?

A. Not necessarily above if one was formed after the other, presumably there was some mineralization in the first before the second was formed.

111 Q. Having your mind attracted to the fact of contact between the two rocks, and an opening, space on the plane of contact?

A. Oh, that I should not admit, that there is an open space on the plane of contact. That contact might have been a line of weakness, and doubtless was in this particular section, and accounts for the fissures following that contact. But there certainly was no open space on the line of contact until the fissures were created.

Q. Then, it is your idea that the south dipping vein formed along that contact first?

A. Very likely.

Q. And then the north dipping vein was formed along the same contact subsequently?

A. Along the same contact in parts.

Q. Is it your idea that the south dipping vein had any further upward extension at the time of the occurrence of the north——

A. Very possibly it had. That I don't know.

Q. That you don't know. Well, in order to create a fissure such as you have stated as observed here in the north dipping vein, it would require some considerable dynamic force?

A. It would.

Q. It would necessarily fault the original vein, the first vein?

A. Not necessarily fault it, no.

Q. Not necessarily?

A. Probably would.

Q. Probably would. Well, upon the probability, where would you say was the faulted segement of that vein?

112 A. That I don't know. The meeting point of these two veins, as you go up on them, is almost at the cap, and if there had been a segement of the south dipping vein which was faulted by the north dipping vein, and this segment was faulted to a higher elevation, it would necessarily have been entirely removed by the extensive erosion which doubtless preced- the overflow of the andesite cap. That is the reason I did not wish to express any positive convictions as to the previous existence of this faulted extension.

Q. Well, have you determined whether this fault, as you say there was a fault, was a normal fault or a reverse fault?

A. I have not.

Q. You have not made a very close study of the faults then, in this neighborhood?

A. Not an extremely close study, because the faults, as a rule, do not interrupt the continuity of the vein, and I have looked at this matter from the standpoint of the miner, who, if he can, follow his ore through a continuous stope, or a continuous working of any sort, pays minor attention to the faults.

Q. Yes, but you are not testifying as a practical miner. You are testifying as an expert from world wide experience.

A. I am endeavoring to testify as an experienced practical miner.

Q. Practical miner?

A. Yes. I have necessarily absorbed a little, endeavored at least to learn a little geology, but I am in no sense a geologist.

113 Q. Well, you are willing to rest the situation and your judgment upon your lack of knowledge of the existence of faults in this immediate section of the mine as to their character, the extent of the throw, and whether they are reverse or normal?

A. Well, I have simply stated that where the dislocation of the faults is apparently trivial, I have not entirely disregarded them. I have endeavored to determine whether the throw is trivial or not. Where I can follow from ore to ore, I have considered that they are of no special significance.

Q. As a matter of fact, you take a vein that is as massive as this

is, has a subsequent faulting a considerable influence on the vein structure?

A. If it dislocates the vein, it certainly has.

Q. Isn't there usually a considerable breaking up, fracturing of the enclosing rocks in the neighborhood of the vein?

A. Very often.

Q. Isn't that a common occurrence in veins of this massive character?

A. It is, as I say, very often.

Q. Very often, you find, then, fractures both in the hanging, which is the indication—which is interpreted as having been affected by dynamic force?

A. Yes.

Q. That is correct, is it not?

A. That is correct.

Q. So, that you have frequently in mines of this character, I assume, conditions which resemble masses of stringers putting out from either the foot or the hanging, or both, as a matter of
114 frequent occurrence?

A. No, on the contrary that is an extremely unusual occurrence. There are very few stringers putting out from the walls of any of the veins. There are a few branch veins of considerable extent.

Mr. Dickson:

(Q.) You are speaking of this territory?

A. I am speaking of the entire mine, yes. There are very few stringers, in deed.

Mr. Lindley:

(Q.) Well, I will take up that branch of the subject later. Upon what are all of these upraises extended? Are they extended along a fault plane? I say these upraises, I mean what you have not denominated as the litigation upraises?

A. They are extended along the plane of the north dipping vein, which is — a minor extent a fault plane, the same as the plane of the south dipping vein is also to a still lesser extent a fault plane.

Q. And you call it a fault plane; it lies on the contact between the two rocks?

A. Yes, if there had been movement—if there are indications of movement, I call it a fault plane.

Q. As a matter of fact, almost all fissuring is the result of faulting, is it not?

A. Almost all fissuring is accompanied by faulting.

Q. Now, how far in upward ex-ent from the levels to which these raises are extended can you follow what you call the north dipping vein in the upraises?

A. You can follow them to their tops, except for the interruption by the cap, with the explanation that in raise 5 A, which I believe
115 is the only one which has reached the real top, the top there, is a result of meeting the cap and also a line of faulting, an

added complication. And the upper portion of that raise, while it is in trachyte immediately beneath the cap, does not contain a vein.

Q. Are those veins that you say exist in those upraises cut off by the fault above at their tops, or at the tops of the upraises?

A. With the exception of this one, no.

Q. Do they have further upward extension?

A. Yes, they have. Probably not great, on account of the cap.

Q. Do they penetrate into the cap?

A. The cap shows above them in several instances.

Q. Well, the dynamic force that created that vein expended itself in that region, then, I suppose, in the upward direction?

A. Expended itself?

Q. Its force. In other words, there is no extension into the changed formation, the capping of this north vein?

A. Well, of course, if the capping came after the vein, there might have been a tremendous dynamic force, and it did not expend itself in the cap because the cap was not there.

Q. Then, it is your idea that this lay in the open air before that capping came out?

A. Not lay in the open air, but there doubtless was great erosion and the open air was somewhere, but doubtless much higher up; how much higher I would not say.

Q. At some time that was open air?

A. Sometime, some point above that doubtless reached the

116 surface, yes.

Q. The original geological surface is represented by the plane of contact of this later overflow, is it not?

A. The original surface of the ground at the time the overflow came, yes, certainly.

Q. In other words, where this later flow has come along and buried up these apexes, that was an original surface?

A. That was the surface at that time.

117 Q. Have you examined the upper end of those veins to any extent to determine whether or not there is any indication of their having a surface?

A. I have examined the upper end.

Q. What position would you naturally expect a vein that had at one time appeared at the surface, and where it was subsequently covered over by a strong flow—what condition of the vein would you expect to find, as indicating that it was a former surface?

A. Well, as a long interminable time has intervened, I do not know that you would expect to find the conditions which you find on the outcrop of the vein on the surface here.

Q. Why not?

A. The period of oxidization, if there was oxidization, and the conditions which existed many millions of years ago—I could not attempt to get at.

Q. Well, we judge of those appearances.

A. I think that it is entirely wrong to suppose that the climate of Tonopah is the same now as it was the many millions of years ago.

Q. Well, I judge from your testimony then that you do not find any oxidization on these veins?

A. I do not find any oxidization there.

Q. That is what I would imagine from your examination. Consequently if that was at one time the surface, subsequently covered up by this later flow of trachyte, there is no evidence on the ground now?

A. There is no evidence; there is some evidence in many cases; this cap line not only descends toward the east, but it descends also towards the south, and we have many times much deeper down where the cap actually reaches the vein, we find a similar appearance in those places as regards oxidization; I do not mean to say that there
118 is no oxidization in the mine; there is a great deal in places. you find the red iron stain stuff, but I do not notice that there is any connection between them.

Q. That terminates between that and the west——

A. It terminates against the Brougher capping, which has the same effect as the andesite cap beneath.

Q. That was at one time also eroded surface?

A. I should judge it was.

Q. Have you examined the termination of that vein up against the Brougher mountain dacite in the west country to determine whether there is any evidence of that vein having once been oxidized and once been the surface?

A. I have; I find a similar condition at the head of the vein; there is a place where you can find oxidization and of course the cap rock which has been termed the Brougher mountain dacite is a much more recent eruptive than the cap rock which is termed the andesite and lies over the eastern portion of the mine, so that the conditions under the andesite cap and the conditions under the Brougher dacite cap may be different.

Q. That is may have been different?

A. Yes.

Q. So that the oxidization which may have been found in a pronounced degree along towards the west, is a larger degree of oxidization than occurs where you have indicated the upraise?

A. If there is any difference I would naturally expect to find it there, because the eruption came at a later time and a longer period to oxidize.

Q. When we speak of geological time we do not think in terms of days or months or years?

A. No as the geologist says a million years is but a moment, so that is too long for me; but you may be misconstruing my ideas; I do not suppose for one moment that this edge against the Brougher Mountain dacite stuck out into the ground there; I presume
119 that this vein along this edge extended much further to the west, it certainly is an absolute impossibility that this enormous volcanic eruption, where there is not only manifested a vast upwelling, but a vast upwelling as shown by the brecciated material, and immense blocks of rocks are included in this Brougher, that it is an absolute impossibility that it gently shoved up and did

not affect the oxidized surface of the vein. It must have broken off immense portions of the vein; but this is pure theory on my part, I do not know the facts. It seems to me inconceivable that it came up and did not disturb the outcropping edge of that vein; so the oxidization that is along that vein I would say is all subsequent to the erosion and due to the surface waters which have percolated down, and assisted the oxidization which was there before the volcanic eruption of Mount Brougher.

Q. Isn't it a fact that in many portions of this mine, other than up at this critical point of it, that you find these rolling shaped ore bodies that form anticlinals in a smaller degree and that the miner has mined them in that shape and that the stopes show them to be in that shape?

A. No.

Q. That is true, is it?

A. That is not common.

Q. Does it occur?

A. It does occur in more than one place.

Q. Let us point out all the places where it occurs?

A. First in the connection between the McNamara stope, at the foot of raise A.

Q. I am speaking of the mine?

A. There is no rolling connection as termed, but there is a case where stopes have come up, if you use the term roll to the stopes themselves, it is proper; There is another marked case in a small space lying under the fraction vein in the Jim Butler mine and shown upon this model where the red——

120 Q. 728?

A. At raise 728. There is an ore body which lies neither in the main vein nor in the fraction vein, but on a small branch of that vein, there is a c-se where there has been,—there is a stope which goes up similar to the stope of the McNamara. There is one other place where there is a little roll in the vein, if you wish to use it that way, two fractures have created that appearance, and that is in the Jim Butler workings from cross-cut 712. It is very small and minor and is correctly shown by the stope running out from this 712; it is compared with the entire vein almost unnoticeable, but it is a portion of the West end vein, where there is in the end a slight dip to the north of a portion. Those are the only places that I recall in all of the mine.

Q. What is there to indicate in this section of the country underlying raise A, where the stopes go up from the West End workings, pass over, downward, *is* it does pass, on the north dipping vein to indicate separate and distinct veins? I am confining you now to the indications in the wall as they remain there regardless of what is shown in raise A?

A. In the stope itself before this work recent work was done there was very little indication; as I stated in the first place I do not believe I would have been a keen observer to have originally noticed anything, although there is today in the wall of that stope an appreciable displacement,—a displacement of about ten inches in hang-

ing wall side; about ten inches between the south dipping vein and the north dipping vein; it is however apparently trivial, but I cannot say if it is, it would have been sufficient without any knowledge whatever to have given me the idea that there were two veins.

Q. Well, is it not a fact Mr. Wiley, that the controlling
121 factor of this determination of your-, that there are two veins, is the change in the dip?

A. It — one of the factors; it is by no means the determining factor.

Q. I didn't ask you that.

A. It is the factor which would primarily lead me to suppose they were different, because it is a very unusual condition. The same vein dipping as these do. Not that it is unusual for a vein to change its dip; it is common, but the controlling factor which leads me to the conviction that these are two separate and distinct veins is the factor which, Judge Lindley, you have asked me to dismiss from my mind and which I cannot.

Q. Well let us stop and investigate the conditions there in that upraise? What is the structural difference between the north dipping vein and the south dipping vein?

A. The veins are similar in filling. You cannot tell by the quartz which vein it came from.

Q. What is the difference in the vein which is shown in the north dipping and the south dipping vein, and that vein shown in the upraise?

A. The veins are similar in appearance except that there is not payable ore, although there is some ore of value in the vein.

Q. How is it structurally compared with the north dipping vein?

A. It lies conformably in dip with the north vein, as the upward continuation of that vein,—in my opinion.

Q. Is the formation, the vein material, shown in that stope, the same identically the same as that shown in the north dipping vein?

A. It is the same.

Q. It is the same?

A. I do not wish to say the same identically, because I could not say that, of the same vein at ten foot intervals, it is the same
122 throughout but there are often variations in short distances in the filling of any vein, so that the words 'identical' is too conforming.

Q. You do not like to answer that question categorically?

A. I like to say that it is quite similar both as to quartz——

Q. Can you tell the vein filling and vein matter, taking the cross section between the south and north dipping vein, take the material and distinguish it if you saw a cross section of the vein?

A. If I saw a cross section of the vein? If I saw the quartz whether it be a chunk or a wagon-load, out of raise—A, and a chunk or a wagonload out of the north dipping vein, I could not tell the difference except as you might select ore from one or the other, and in raise A we do not have payable ore.

Q. Well, quartz is quartz, isn't it?

A. Broadly speaking it is, yes, a definition.

Q. But a vein is very frequently made up of other things than quartz?

A. Very often.

Q. Now I am asking you to take this vein as a whole, not by a piece of quartz, and compare a cross section of that vein with the south dipping vein. I am speaking now of what a miner might term vein matter as well as the included quartz, and compare what is shown in that upraise, either the south dipping vein or the north dipping vein, as you please.

A. As I said before it is similar filling; it is not ore, and you can get ore from many portions of either of the other veins.

Q. Does it contain anything not found in the other veins?

A. I have not observed anything distinctly.

Q. Well, have you observed anything which would lead you to believe that there is a difference?

A. Not any more different than you will find in the same
123 vein in different places, close to each other.

Q. Roughly or minutely rather, if you please, describe the contents of this vein as it occurs in the upraise. I am referring to the upraise marked —A in the neighborhood of 152. Describe the contents of that fissure. That is a fissure I believe, is it?

A. There is a fissure extending up that raise.

Q. What is the width of the vein in the fissure?

A. I do not know the entire width of the vein as disclosed. The width of the working is four to five feet.

Q. Four to five feet?

A. Goes up on a slope of around thirty degrees, about the same as the stopes below, for a height of around fifty or fifty-three feet, if I remember; something like that. It follows a streak of quartz at the place two or three feet and enters narrower*m* considerably narrower; but as I stated that vein is often wider than that, but I do not know that it is disclosed in this raise.

Q. What is there in the vein besides the quartz?

A. Country rock, in that section a trachyte and that is immediately beneath the cap? Within a very few feet.

Q. Does it contain any round pebbles or anything of that kind?

A. I think that you will doubtless find some round pebbles, the same as there is in most veins. I don't recall any distinctly but I would naturally expect to find some there.

Q. In stoping that ore, evidently, the miner has evidently not paid any attention to the vein shown in that upraise?

A. No, the quartz in that upraise is not pay ore.

Q. To what extent has that vein at that point an upward extention?

A. Probably to about only the extent of raise—A, fifty feet or so, because the cap lies immediately above and is developed in raise 152 within ten or fifteen feet of the head of this raise.

124 Q. That must have been pretty close to the original surface before the later flow?

A. Yes, sir.

Q. Was the original, wasn't it, in your judgment?

A. It was the surface at one time.

Q. Any evidence of oxidization in the upper part of that vein?

A. Nothing striking.

Q. Was any gouge or selvage or slickened side to indicate a movement?

A. I noticed no special slicken sides, but it is not as striking there as in portions to the east.

Q. Now are you familiar with the section of the mine disclosed in the cross-cut, what we call the 712 Butler cross cut?

A. The 712 Butler cross cut is shown on the model on the seven hundred level of the Butler extending where I now hold my pointer. I have been through there, yes sir.

Q. You recall the conditions shown in the 7-A raise?

A. I do.

Q. Do you find any conditions shown in 712 Butler Cross cut similar to the conditions shown in the 7-A raise?

A. Well, that is rather hard,—I find the quartz in the cross cut in places where it intersects the vein, and some quartz in the trachyte between, and I find some in 7-A; I find trachyte in each case.

Mr. Lindley: Will you please read the question?

(Question read.)

Q. Can you answer that yes or no?

A. Yes, in the way that I have mentioned.

Q. That cross cut cuts quite a number of stringers.

A. Yes, it does; most all quartz which is impregnated out of the trachyte.

Q. How about,—state the conditions shown in what would be a cross section, if you can, in the Jim Butler raise- 595, 571, 571 and 573; our raises 571 and 573.

A. I do not know which they are. Will you please show me.

Q. Yes. We have not got our numbers on here. They are very near your cross section?

A. They are not Jim Butler raises.

Q. West End, I mean. I beg your pardon. I should have said West End. I want to call your attention—bearing in mind the conditions that you say exist at the West End of that roll where if it had not been for the putting up of that raise, you might have been led to the belief that it was all one vein that changed at depth; I want to ask you if you have really in mind the conditions as shown in the raises 571, 572 and there is another raise on the four hundred,—494; that is the raise I have reference to. Well, let us confine ourselves,—I will get that straightened out in a minute,—to the raises 571 and 573; first I understand that raise 571 is in close proximity to your cross section; what is the number of that cross section?

A. A and B.

Q. Well, now we go a little further to the west and take the up raise- 571 and 573. I wish you would describe to the court just exactly what is exhibited in those upraises, as showing the change in the width of the vein, if there is anything, or showing the exact re-

lationship in which these two veins exist in that section of the mine?

A. You have asked me to just exactly and precisely describe it,—I would prefer to refer to my notes.

Q. You have a right unless you say — cannot do it without your notes?

A. I can in a general way.

Q. So long as we get the results in such a way that I can understand your statement? You understand what I desire to
126 have explained?

A. Where you have emphasized the word "minutely" and therefore I would prefer to use my notes.

Q. Well, proceed, we are not going to quarrel over a little matter like that.

A. I have a little sketch here in my notes.

Q. Well I would like to see the cross section when you get through with it.

(Cross section handed to Mr. Lindley.)

I assume Mr. Wiley that these were made underground, made on the spot, or at least computed after a reasonable inspection.

A. These were as a matter of fact sketched underground, that is all of the marking*ing* indicating the veins or geology, or anything of that sort; they were accurate cross sections made before going underground from the survey, and then the observed facts put on.

Q. Give us the three raises there?

A. 569, which is the most easterly of the raises come- up from the fault upon the south dipping vein.

Mr. Dickinson: Mr. Lindley, I would suggest that it might be well for the witness as this is a sketch not yet in evidence, in describing it, to have it where the court can see, in order for him to know what it is.

Mr. Lindley: If counsel wishes the witness to put it in I have no objection.

Mr. Dickson: Just as you please.

Mr. Lindley: Well, I do not care, Judge Dickson, just whatever way that you want to do it. I want to get at the general deduction here.

Mr. Dickson: Well, you wish the court to understand it.

Mr. Lindley: Well I could not understand it unless I saw
127 the sketch. Proceed any way you please gentlemen. It is up to you.

The Witness: Shall I show this to the court?

Mr. Lindley: If you wish.

The Witness: The picture always to me is plainer than a description.

Mr. Lindley: Well, identify those as soon as they have been,——

The Witness: The first sketch is marked "R-69."

Mr. Lindley: Mark it "Wiley—5" and the*m* number them along, as they come.

(Sketches marked for identification.)

A. The sketch marked "Wiley—5" is a cross section of raise 569, in its upward part, and it also shows the raise 488, which is on that same immediate cross section, extending above this, as well as the workings upon the north vein, lying immediately to the north; the red color is meant to represent the south dipping vein; the stopes upon this vein come up to the place marked "stope" at 68-feet, dips 30 degrees, that indicating the dip of the south vein at that point; the raise goes up,—the structure of the south dipping vein, the dip of it indicated the mark 49 degrees, at a point a short distance above this, marked "ore" there is a clear cut cross dipping direction marked 48 degrees and dipping directly across; that is a point which I have called the top or highest point up on the south dipping vein.

Mr. Lindley:

Q. Can I ask you with reference to the nature of that, if it — just a slip or is it a fault?

A. It is a cross fracture, not I would say a distinct fault, although there has been some little fracturing along there, indicating possibly slight movement.

Q. Does it fault towards the vein?

128 A. The extent of the fault if it faults the vein, I do not know. It does fault the vein in the sense that it interrupts *the* its continuity upward.

Q. Now, just one moment please.

A. I mean by that that if there is a fault I do not know just how much faulting there has been.

Q. I would like to get your understanding as to what your fault is. What is a fault?

A. A fault, as it is commonly used, is a cross fracture running,—not necessarily a cross fracture, it may be coincident with the plane of the vein in direction, and usually it is more or less at variance in direction. It may interrupt the continuity to a slight extent or to the extent of hundreds or thousands of feet; I have heard of faults being of a mile displacement, and on the other hand it may not be much at all.

Q. However it indicates a movement?

A. But the movement may be from an infinitesimally small movement, to an enormous distance.

Q. A sheet of paper might be placed in the section and destroy the continuity. Would you call that a fault?

A. There might be the plane of fracture of the fault represented simply by a sheet of paper, and it might in that sense be a fault, and yet not have faulted this particular thing; not have thrown it or displaced it.

Q. At this particular point where we are discussing the vein are the walls displaced?

A. I do not know, I simply know that I am going upward at 49 degrees to the south, and I meet a cross dip of 48 degrees to the north.

Q. But that vein continues on in the same plane. And that course on its upward extention?

129 A. By no means. A vein continues on in an entirely different plane.

Q. There is has the same upward direction?

A. Both go upward but entirely in a different direction.

Q. Well, as I understand your illustration, might not you have got your intersection of that so-called cross plane before it commences to turn to the south and the north so that there is still an upward segment which you say destroys the continuity,—but nevertheless it continues upward in the same plane some distance.

130 A. The working continues up a short distance but the vein does not.

Q. Has not the vein been in the working?

A. The vein is in the working, the south dipping vein is in this raise 569 to the point where the dip of the structure and the dip of the vein is entirely different. Above that a working goes in the north dipping vein rather poor for a while, and a good deal of trachyte country in there until you reach the foot of 488, which has been driven upward back above the top of the south dipping vein for a considerable distance. The scale of these sketches is 1 inch equals twenty feet. May I mark that? It is not on.

Q. Certainly.

A. So that the squares on this, the large squares represent 20 feet, and the small squares each two feet.

Q. Well, have you finished with that sketch, Mr. Wiley?

A. I think the sketch itself shows, except, I think I should, in fairness, Judge, explain that under this point there is a working which has very much more the appearance of a roll of the vein, or bending than the 569 itself, and I have put that upon this section.

Q. That is shown on the model here, is it not?

A. It is shown on the model. And there you can follow from raise 569 to working——

Q. It is on here. I am pointing now to what is marked here 569.

A. You are pointing to the same raise as I have indicated upon this cross section. You are following quartz there right around on a gentle slope, come around level for a ways in quartz,

131 a little trachyte where these dots are marked. I think I should explain that I did not carry many colored pencils underground, and my conventional sign for trachyte is a series of dots. But you go in quartz, very large, good body of quartz all the way from this south dipping vein, follow around to a north dipping vein, you have not left the vein all the way. But you go from the south dipping to the north dipping vein, and you have no interruption other than this cross break between the quartz of one and the quartz of the other, and you have similar quartz.

Q. Now, with reference to this quartz break, so called faulting which you named as the terminal edge. You claim that is the terminal edge of the south dipping vein?

A. I don't know just what the terminal edge, I suppose the upper portion of the vein would be the terminal edge.

Q. Well, what is a terminal edge? What do you mean by a terminal edge? We will see that our definitions may agree.

A. I presume that as applied to a vein would be the portion, assuming that this is the hanging wall where I now hold my pointer, that is the highest point on this cross section and the terminal edge would be the line following through this plane of section in an easterly and westerly direction.

Q. Well, do you claim that that is the apex of the vein at that point?

A. Well, I am not giving a legal definition of a vein. I can give you a miner's conception of what an apex is.

Q. Well, you fixed an apex for the defendant in this case.

132 A. I can give you——

Q. And I want to get your idea of what an apex is to see if it follows the idea of a terminal edge.

A. I frankly confess, Judge Lindley, that my conception of an apex is taken largely from a work which has helped me very much, "Lindley on Mines."

Q. I knew I would get it before I got through with the case. Never tried a case in my life that I did not get it. The great trouble is that you people pick out such things and suit yourselves, and you do not always pick out things that suit me.

A. Well, it must suit you because you have very clearly stated it, that the apex of the vein is the surface, and I fully believe that is right. It is not the terminal edge. It is the surface. The top of the vein at the surface is the apex, in my opinion.

Q. It may be blind, may it not, and not reach the surface?

A. Then it is that portion nearest the surface; the part nearest the surface.

Q. Well, doesn't that involve the element of terminal edge?

A. The terminal edge would be one boundary of that surface.

Q. Then, it is an essential definition of an apex that it is the highest point nearest to the surface, reached from a descending point to an ascending point on the dip of a vein? And the terminal edge is where the vein ceases?

A. On its upward course.

Q. On its upward course. Is that correct?

133 A. A point on the terminal edge could be so represented.

Q. It would be represented in cross sections as a point, something more than a point, it is a surface?

A. I think it is.

Q. A terminal surface?

A. Yes.

Q. That is beyond which the vein has no further extension upward?

A. Correct.

Q. That is correct. Then, we agree, and "Lindley on Mines" is vindicated this time. Now, taking that definition of what constitutes an apex, is it your opinion that the termination of that vein against that slip there comes within your idea as to what an apex is?

A. In this particular section, yes.

Q. Is there anything that continues beyond?

A. There is nothing. I have no knowledge of anything in this particular section.

Q. In this particular section?

A. Yes.

Q. Well, you have a knowledge in some other section where that thing don't happen?

A. I have, other sections close to this where it is not cut off in the same way.

Q. Then, you m-ke that an apex on account of this slip?

A. In this case it is the upward portion of the vein.

Q. And the vein has no further upward continuation beyond that slip?

A. It has not.

Q. Has it any continuation in any other direction?

134 A. It has continuation downward and to the east and to the west.

Q. But not——

A. Not upward.

Q. Has it a different dip? Does it continue on in an opposite dip? Does the ore continue on in an opposite dip?

A. There is ore in the north vein continuing on in a directly opposite dip, both downward and upward.

Q. And the only thing that segregates the two is this slip?

A. The only separation is this in this immediate working in this slip.

Q. Are there not through this mine an infinite number of just such slips where there is evidence of faulting and displacement of the vein?

A. There are a great many slips in different directions.

Q. Does that constitute separate veins whenever those things occur?

A. No.

Q. There are a number of very marked displacements, are there not, caused by faulting?

A. There are.

Q. One of them shows on your cross sections here?

A. There are several shown.

Q. Take for instance what you have illustrated here as the Fraction vein; we have got a fault there.

A. We have.

Q. Does that destroy the identify of that vein?

A. It does not, if the two sections are portions of the same vein.

135 Q. A portion of the same vein. Well, you have no such condition as that shown upon your exhibit "Wiley No. 5," have you?

A. No.

Q. Now, you may proceed with your next section.

A. The next section marked "Wiley 6," is a similar cross section of raise 571. There we have the same or similar conditions, the stope upon the south dipping vein. We have a similar cross fracture

in this raise, and we have a similar working which has been made over on the north vein. In this particular workings, while I consider the portion immediately above is a part of the north dipping vein, I have not colored it and I have marked, a little quartz, trachyte. It is essentially a trachyte in the vein. There is one point where I have marked a red streak above that which has a nearly vertical depth, dipping slightly towards the south, which is probably a portion of the south vein. I have marked it red. Across the top of this, I have drawn a distinct blue mark, which is the hanging wall of the south dipping vein and contains some clay. There is one unusual condition in this cross section, which is shown in cross cut 430; there is a two foot streak of quartz, south dipping above there. That is the only place in the mine where I have noticed that south dipping quartz above the north dipping. You asked me a while ago about that and I said I did not observe any upward extension; there is the only place where there is such extension.

Mr. Dickson:

(Q.) This is on Wiley 6 now you are referring to?
A. Wiley 6.

Mr. Lindley:

(Q.) Well, you have not indicated that slip; is that a
136 clean parting between the red and the yellow, that slip?

A. That is a very clean parting, at the top of the red for a distance. At the extreme bottom it is not. I have not drawn that slip clear through for that reason, that at the immediate floor there is not.

Q. An unbroken footwall there, is there not?

A. No, I don't think it is the footwall. I think you could sink down a winze here in quartz for a considerable distance. This is an instance here of what I endeavored in my direct to call attention to, of the mineralization under these two veins. Extends in some instances as much as a hundred feet away.

137 Q. As a matter of fact, a miner in stopeing that would stope that all as one vein, wouldn't he?

A. No, he hasn't stoped it as one vein, so I don't suppose he would.

Q. He has not?

A. They have stoped there and they have all been in the South dipping vein; no stope in the North dipping vein at all.

Q. I am speaking now of the occurrence not in that particular stope, but the occurrence when he meets it anywhere in the mine?

A. If that was all paying ore, why he would have stoped it all in one mass, regardless of its dip; that is true.

Q. But the ore is there, and it has not been stoped?

A. I have got a place marked here, but that is on the North dipping vein. That does not necessarily mean that there is a body of stopeable ore, but there is some little good ore.

Q. Miners do not usually pay much attention to slips of that kind?

A. He is after his ore and follows that wherever it goes.

Q. Unless it faults his vein and he has to find the faulted segment he does not pay attention to those slips?

A. If his vein is distinctly cut off by a fault, he naturally endeavors to find the faulted segment, yes.

Q. So long as the ore continues, he continues at his work? That is a fact, isn't it?

A. The ore is the primary thing, certainly.

Q. Well, now, there is another section you have there, Mr. Wiley. Have you marked this?

Mr. Dickson: That is marked "Wiley 6."

A. The next section is a section of raise 573, and shows a different——

138 Mr. Dickson:

(Q.) That is marked "Wiley 7"?

A. This is "Wiley 7." It shows a different condition in that the cross slip there is not so prominent. It is marked and I have got the word "Fault" marked, some little faulting. And the red in that case extends above that for a considerable distance. That is essentially the same, there is a body of trachyte there in between. I have marked it trachyte—"Tr."

Q. Where do you say is the terminal edge of that red vein?

A. It would be the highest point, which would be beneath the raise 461, which extends back beneath the footwall side of that raise. Extends in the North vein.

Q. Then you ignore the slip as constituting the terminal edge in this cross section?

A. In this cross section; further to the west the quartz of the south dipping vein itself extends up above this particular slip which is shown there.

Q. Then that particular slip there hasn't anything to do with the termintation of the vein in its upward course?

A. It hasn't in this section, nor has it on some other sections further to the west.

Q. With reference to the condition west of that upraise, that is, west of this series of raises, 2 A, 4 A, 5 A, 6 A, 7 A, what is the distance, measured in the plane of the vein westerly before the contact upon the two veins is disclosed in the workings? There is an intervening space between your 7A on the model and the area covered—between that point, and generally speaking 302 E; what is the distance of unexplored area there?

A. The distance between 7A a-d 302 is about 350 feet.

139 In that section there are no workings which disclose both of the veins. In fact, there are no workings which disclose any of the veins near their top.

Q. Well, that is undeveloped?

A. That is undeveloped and very much *much* distrubed by the cross Edwards fault, and also by the descending cap rock.

Q. Well, you do not doubt but what the veins exist in that section, do you?

A. They exist deeper down, that we know.

Q. Well, have you lost your apex during that 300 and some odd feet?

A. No.

Q. Where is it?

A. There must be a—the highest point to which the vein goes. The highest point developed upon the vein in that section is shown by the raise above the 400 foot level. They have not reached the absolute apex through that section, so that must be at a somewhat higher elevation.

Q. I am speaking now of the lines of contact between the two?

A. The north dipping vein is undeveloped and unknown for a section through that area, due to faulting. And its apex is doubtless much lower down on account of the rapidly descending cap. In other words, there is unquestionably, in my opinion, through this section an area where it would be an impossibility to bring the top of the two together because it does not exist.

In other words, each of the veins, the south dipping and the north dipping, for a considerable section will have apices
140 which are some distance apart. Even if originally the two met, if it were an arch, it would be the bottom of the arch, and if coming at angles it would be the apex, that has been entirely scored away and buried beneath the cap, so that for a distance there they must have separate and independent tops.

Q. Well, that implies a considerable force and a considerable grinding and moving to eliminate all that section of country, does it not?

A. No; to my mind it indicates nothing of the sort, necessarily, although there has been through this area the Edwards fault, and that has had its effect upon the dislocation. But to my mind, the main factor is the cap; that the cap is much lower down in this area than it is further to the west, and therefore the original surface, the eroded surface was lower down, and the erosion, even assuming that these veins originally did meet—and I don't know that they ever did—but if they did meet originally, they were eroded away so that they had entirely separate outcropping tops to the surface of the ground before this andesite cap came on.

Q. Wherever you find the yellow and red veins in conjunction in the west section, now, proceeding towards the westerly section of the ground from 300 to 3B, I assume that the first point going to the west from raise 7A where the two veins are shown in the model to be in the contact is in the raise 302——

Mr. Dickson: Will you excuse me? I want to get the question.

Mr. Lindley:

(Q.) 302, is that the correct raise?

141 A. Yes.

Q. Now, the first point going west from 7 A, as I understand it, what is the condition there where those two things are in contact?

A. We have a similar condition. We have a raise, 302, going up from drift 302 E on a vein which dips about 28 degrees to the south, a large body of ore. We follow up that raise and we meet a vein having an opposite dip.

Q. At that point what is there to indicate a difference between the two veins?

A. The difference in structure. There is a small fault shown in blue across the red at that point. But the dip of the vein for a distance above that is still to the south, and at the head of that we meet a raisr dipping in an opposite direction shown by the yellow coloring, and this is upon the north vein—a portion of the north vein.

Q. There is no faulting of either vein at that point in the sense that it indicates a movement, or that the parts are dislocated?

A. There is only the faulting shown by this blue streak, and there is a very considerable movement or indications of faulting along the hanging wall of the north vein itself. There is a blue mark on this raise also lower down which is not colored for this section here, because it — entirely inac-essible and it is caved through that section and I have never seen it. But lower down in that raise I know there is a fault of considerable magnitude. There has been extensive faulting, doubtless faulting greater than usual through that section.

Q. Well, the section between 7A and the raise you just
142 now spoke of is practically undeveloped?

A. It is undeveloped above the top of the workings shown.

Q. Above the top of the workings shown. And whatever you have to say in regard to that is conjecture or probability?

A. It is based upon the development as shown.

Q. It is what we call projection, mental projection?

A. No, it is a great deal more than mental projection, because we have the physical fact of the vein deeper down in the raise,—extending above.

Q. I am speaking about that area that has not been developed so far. That necessarily must be projection?

A. That is projection based upon the facts observed.

Q. Undoubtedly; no question about that. Because if we had had no basic facts, there would be no projection. Can you give me the dimensions of that slip? I am back to raise 302 now. Describe that slip. Is it in gouge? Is it a parting? Is it a distinct cleavage between the walls?

A. It is a distinct cleavage across the vein.

Q. Well, how thick is it?

A. The rock is broken for a considerable distance, but the particular, the most noticeable cleavage or line of dark material there is comparatively within two or three inches.

Q. Is it that thick?

A. Yes.

Q. Two or three inches. Is it a gouge?

A. Two observers can differ as to the width. A fault often has clay which may be quite thin, from the thickness of a piece of paper up to any thickness. And extending back of that would be
143 the material more or less broken. One man might limit his width to the exact dark clay, and another man might take in the zone of brecciation extending back from this slip. But there is a very distinct slip there a few inches in width; broken material extending back for some distance further.

Q. The walls of the vein faulted——

A. The walls of the vein——

Q. I mean in juxtaposition do they not continue along precisely in the same plane above that slip, in the same direction that they continue below?

A. The quartz does.

Q. Well, the quartz is vein, isn't it?

A. It is, usually.

Q. Consequently, you say that that slip there terminates the South dipping vein and makes an apex?

A. No, not in that raise, and I haven't so represented it.

144 Q. Well, the walls of the veins faulted; I mean in juxtaposition. Do they not continue along precisely in the same direction as they continue below it?

A. The quartz does, yes.

Q. Well, the quartz is the vein?

A. It is.

Q. Consequently, you say that slip there terminates the south dipping vein and makes an apex?

A. No, not in that raise, and I have not so testified.

Q. Not in that raise. What effect has that slip had on the continuity of the vein?

A. It has none.

Q. What is the difference between that slip and the slip that has occurred in the east end of the mine?

A. Nothing whatever.

Q. Why?

A. In this particular working the quartz of the south dipping vein continue- up to the same dip it has below, whereas in 569, it——

Q. It turns over?

A. It has; it does not turn over but it meets quartz having an entirely different direction, extending downwoard and beneath the stope extending downward and upward.

Q. In one instance the slip makes two veins and in the other it does not?

A. No, that is not true at all.

Q. Why isn't it? It is the change in the direction of the dip?

A. It is the change in the direction of the dip, a marked change to the continuity in both directions of one vein, and a seces-
145 sion in the upper direction of the other.

Q. Now, have you any more upraises out to the west here that are similar to your upraise down at the east end?

A. There I have a——

Q. I have reference to 2A, 4A, 5, 6A and 7A and others than upraise A which you have testified to before?

A. No, none similar; we have several upraises in that section but they are not what you would say are similar. They have followed the north dipping vein upward.

Q. Above the south dipping vein?

A. They do not.

Q. They do not go out above the south dipping vein?

A. Many of the raises, but they do not follow the north dipping vein.

Q. In many points to the west of raise 7 A in that upper working where you follow the north dipping vein above what we call the junction of the two veins, with the exception of raise A?

A. There are not, except that we have a portion of the north dipping vein shown in the raise extending above drift 202. The cap through this section is shown by the green color as coming down and cutting off the upper portion of the vein. The upper portion of raise 366 plainly follows, and inasmuch as it is cut off by a capping I presume that is the cap of that vein, so perhaps I should refer to that as an exception to the general statement that there are no raises.

Q. What is the condition observable where these two veins are in contact at any point in the workings beyond the raise you have just testified to as 302 A? I want to get at the structural
146 conditions wherever those two veins are in contact to the west, taking up every place where they are in contact and I want you to describe to the Court what the situation is.

A. The raises which extend above are all shown upon this model. The next raise to the eastward of this is raise 364, which extends up upon the north vein, but the upper portion of that is not colored because the air is so bad that an acetylene lamp will not burn and I have not been able to tell what is up there.

Q. When was that raise put up there?

A. I do not know.

Q. Is it an old mine working or a litigation upraise?

A. I think it is an old mine working.

Q. Proceed.

Q. The next raise is the raise extending above this 203 and connecting downward with the yellow raise extending to the MacNamara stope; this raise is up to the cap as shown by the green color and the ground beneath the yellow is only a portion of the north dipping vein because beneath that we have the violet trachyte and then again the yellow, or the main portion of the north dipping vein; in that drift, 203, on the 200 level we have the south dipping vein not only in the drift, but further to the west by the stope. Then there are a series of raises extending above this drift, one marked 203, which extends up upon the main south dipping vein and is cut off by a faulting, so that the top of that raise is entirely in trachyte and is so colored. The cap must be very close as shown by the adjacent raises, but it has not been reached in the working so that there

147 *there* is a strong likelihood that raise 203 is really up to the apex of the south dipping vein, but, not having the cap I would not absolutely be certain that is the highest point of the vein; I believe it is. Going further to the east——

Q. One moment. There is a drift below that where you have a line of demarkation between the red and yellow, a drift or cross cut?

A. Yes.

Q. Now you have a line marked red on that drift, a coloring red, adjoining a yellow coloring.

A. I have.

Q. What is the reason for not marking that all red?

A. The western portion of this vein is upon the south dipping vein. It is actually connected by a short little raise from the vein above; the quartz has the distinct south dip; the southern end of this working has a northerly dip and is in the northerly—the quartz in between is similar; there is no reason absolutely for drawing that distinction at that particular spot, just the same as there is no reason for drawing the exact spot in some of the cross cuts underlying the vein further to the east. That is the direction. We have, first, a vein plainly dipping to the south; at the other end of this cross cut we have a vein clearly dipping to the north; in between we have a stope where the quartz structure is vertical; instead of dipping east and west, it runs north and south, and it is another of those

148 cases to which I alluded or endeavored to make in my direct. Where this north and south break between the points has been silicified, filled with quartz, but you can pass from one to the other in quartz and you go up on one dip and you pass through a vertical dip and a strike at right angles to the strike of the vein, due to the structure across the vein, and you go down then upon the other dip. This is not in any sense a bending from one to the other but it is passing in quartz from one to the other; the structure of the intervening quartz, agreeing neither with one vein or the other.

Q. Now have you any other further connections those so-called two veins? You will permit me to disagree with you about these being two veins, but I am simply following you to get the situation; beyond the point that you just testified to where you stated there is no real reason for the demarcation between the red and yellow going to the west, the next occurrence where the veins are together and where you have the red and yellow marked as in the neighborhood and vicinity of your raise A—are there any other intermediate connections between those two points where the two veins are shown in contact?

A. No; we have the main vein shown in contact.

Q. I am speaking of the red and yellow.

A. No there is not any.

Q. You have examined this ground where we claim it to be a roll?

A. I have.

Q. And ordinarily as you started out to state early in the day, anybody might be mistaken and think that it was a roll in the same vein?

Mr. Dickson: He said that he might be mistaken.

A. I said that if there had been no development in the entire mine, and these new raises had not been made, I probably
149 would not have been observing enough to see this slight indication in the dip, but I would have said you could follow from one side to the other in the same vein.

Q. Well, of course, if you could be mistaken about that with your judgment and experience, a miner might be mistaken?

A. That is all, unless they had this opening.

Q. Well, that is all you have?

A. Well,——

Q. Well, so this is a litigation raise?

A. I know that has been made.

Q. And a miner never discovered that particular vein, or had any particular thing to do with this vein?

A. The miner followed his ore and the ore in this case, did not extend beyond the bend, where these two veins came into juxtaposition.

Q. In other words I presume no criticism could be made as to this winze that was run up by the engineers?

A. It was run up to determine whether the north vein did extend beyond the other, and the explanation that that might be the cause doubtless started from the absolute proving of the fact that it did extend further to the east.

Q. That is proved according to your ideas?

A. Yes, sir.

Q. Have you reached the domain in your career where you can say that anything is positively proven?

A. It is proved to my mind that is what I always mean.

Q. Now I show you a couple of pictures here Mr. Wiley, and I ask to have them identified as "Wiley's Cross 1" and "Wiley Cross 2." I show them to counsel before I offer them in evidence. They are underground pictures illustrating these rolls.

150 Mr. Dickson: Taken by whom?

Mr. Lindley: Taken by Mr. Bradshaw. Simply going to show them to Mr. Wiley in connection with his testimony simply by way of illustration.

Mr. Dickson: Very well, I understand.

Mr. Lindley: Now I will show you a photograph marked "Wiley X3," and ask if you want me to tell you where it was taken and I will tell you in advance; perhaps you may identify it without my telling you.

A. I would suppose from the timbers more than anything else that was a representation of the Jim Butler stope in the Jim Butler workings.

Q. At the seven hundred?

A. Yes, sir.

Q. You guessed right. It shows the roll as you have described it in your testimony?

A. It does.

Q. That is a fair, correct representation of it?

A. Yes, there is a roll, I would probably call it that too. It has the appearance of a roll.

Q. Well, that is what you would call it if you run across it in the dark?

A. In the dark yes, but when I had some light on the subject I would not.

Q. Well, its physical characteristics are not shown by your light are they?

A. Yes, sir.

Q. Your vision was changed?

A. Very much, and the photographic illustration,—I would like in justice to myself to qualify my original term of the roll by the fact, by the explanation, why we plainly follow up and come over; maybe it is a roll,—it is a bend a slight roll; still the fissure as indicated in the upper left-hand side of the photograph, and another fissure which does not show, which would be on the right side,
151 apparentiy do extend up, and also, especially in the drift below where you could trace another view showing the extension of the drift, in these walls apparently beyond. In other words instead of bending they, to my mind seem to cross and make an "X" and so you may have here instead of a roll merely a meeting of the veins. This fissure on the other side may extend beyond as you have simply developed the lower portion of the X or the lower portion of the inverted Y, but in any event you have very nicely illustrated the appearance of the roll.

Q. Well, it took me a long while to get around to it Mr. Wiley. Well, now I will show you another picture here and perhaps you can identify this? Complement the photographer by identifying it immediately; it is taken by the same man?

A. Yes, I can complement the photographer on the first but on the second, this is very much out of focus as regards the major portion of it, and I must confess I am unable to identify that position in this short time.

Q. I can tell you where it is taken. I asked who the most competent photographer was in town and was told that the gentlemen who took these pictures was. Well, I will tell you where this was taken; this is taken at the bottom of your A-raise, they put their camera at the bottom of the A-raise of the McNamara stope, pointing north 45 degrees.

Mr. Dickson: Can you explain to the witness in what direction the camera was pointed?

Mr. Lindley: At the raise.

The Witness: This does not do justice to the stope, there is a better looking appearance of a raise there than this picture shows.

Q. That was due to the infirmity of the photographer?

A. Or the limitations of the excavation.

Q. That is a fair illustration of it?

87

152 A. I don't doubt but it was a picture taken there.

Q. It is the best we could get at under the circumstances, we may do better on a second trial. I want to make the witness's testimony clear of what he want- us to think his views are and I am quite content. It is now twelve o'clock.

The Court: I would like to ask one question. I understood him to say that one of his cross veins of quartz, contained quartz differing from the veins themselves. Is that correct?

A. Different, not in the nature of the quartz, but in the direction; it stands vertical and the fracture in it ran north and south.

(At this time a recess was declared until two o'clock P. M. December 9th, 1914.)

153 Afternoon Session.

WEDNESDAY, December 9th, 1914—2 o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Cross-examination of WALTER H. WILEY, resumed.

Mr. Lindley:

(Q.) Mr. Wiley, for the purpose of clarifying the situation up a little in my mind, I wish you would kindly take this string and indicate what you consider to be the line of contact between the north dipping vein and the south dipping vein, so that we can discuss certain matters that are to be considered in connection with one of your horizontal maps. I want to illustrate the condition on the 400 level, as shown on your plan map with reference to the position of the veins at their—what we call the crest or the axis of the anticline, what you call the intersection of two veins on their upper courses. I understand that that section on which you are tying that string now, if you are going up to the yellow and red in the Tonopah Mining Company's ground, that that is a disturbed section. For the purposes of illustration, kindly take it from within the West End ground. This will simply illustrate the question——

Mr. Dickson: That was what I was suggesting to him.

Mr. Lindley:

(Q.) That is the abnormal at that end. I simply want to take the normal conditions, as we understand them.

154 A. It is going to be very difficult, because the conditions are not very regular anywhere, and the maze of workings interferes, but I will do the best I can.

Q. Can't we serve the same purpose by connecting the extreme western and extreme eastern exposure, which we call the top of the vein?

A. Well, I will get this through there the best I can, I think will answer your purpose.

Now, that very inaccurately represents it. If you wish me to take

more time, I can tie it down to some of the points, but if that will answer so far. Of course, that string should be brought down more, and it is not a straight line in the actual contact, and the string stretches straight.

Now, from this point 7A, where we now have it attached, it is a difficult matter to compare with your question because there is no such line as you mention developed. If I wish to take it across where the probable apex of the south vein is, I can continue the string.

Q. I have laid a pointer on the model. Does that approximately represent the direction of the line of junction between the two veins?

A. Yes, with the explanation that the line is not a continuous line, as is the pointer.

Q. Well, you are connecting—if you are going to take the strike of a vein at the surface, you are going to connect—the average strike, you are going to connect the two extreme points, are you not?

A. If I want the average strike, yes.

Q. Well, does the pointer as it is laid now on the model
155 indicate the average strike?

A. It represents——

Q. In a general way?

A. The average strike of the apex.

Q. I speak of the apex, because it is upon the strike of the apex that rights are defined. Does the way that pointer is laid, approximately, indicate the line——

A. Approximately, but I would like it with that explanation, that through that central section it would have to be represented by two lines. The line of the apex, in my opinion, would continue as a line, one line representing both veins for a distance, and then divides through a section in two lines, and then over here, for instance, (indicating) it would have to divide into two lines because the apex of the north vein is plainly way above the apex of the South vein. So with that explanation, it will serve.

Q. What I wish to get at is the question of the divergence of the two veins, on what you call the strike at the surface or what was originally the surface, and what is now—what we might call the blind position of the junction of the two veins to represent it by that pointer. In other words, you have connected the extreme west end with your extreme east end developments?

A. Yes.

Q. In a general way?

A. In a very general way, yes.

Q. Now, will you kindly refer to your plan map which you testified to, showing a divergence in strike of the vein at the 400 level?

156 A. (Witness does so.)

Q. That is a horizontal map on which the workings are brought up to that level and depicted there, and as I understood your testimony, you pointed out the divergence in the strike?

A. I did.

Q. Of the two veins. Will you kindly take a pointer and indicate

exactly what that situation is in reference to this line indicated by the pointer? Follow the vein—the north and south vein on their contours off the 400 level?

A. The north vein, as represented on the 400 level—the strike of the north vein, as developed in the eastern portion of the mine, would be represented by that pointer, which follows along the drifts from raise 488 to raise 494. The strike of the main West End south dipping vein on the 400 level, while somewhat irregular, could be represented by the other pointer, which I now lay upon the model, pointing towards the stopes at the westerly end, and continuing along through drift 405, drift 429, and on to the bottom of stope 403.

Q. Well, that represents a conical situation, does it not? The south dipping and the north dipping limbs being a solid, and the lines as marked on your horizontal plan indicate that the engineers' strike, or the strike on a level of the two different arms of the—or as you say, the two different veins?

A. It looks as though it could be the top of a pyramid. Were it not for the fact that developments further to the east show that this line is entirely different, it would be quite a—could be drawn
157 to represent the top of a regular pyramid.

Q. Well, a pyramid is supposed to come to a point?

A. These three points, three lines would meet at a point in the upper point, were we to go down.

Q. A pyramid lying on one of its sides?

A. Yes.

Q. Well, that same situation would be obtained as to the engineers' strike on the levels, if that was all one vein, would it not?

A. You could imagine a warped surface where these conditions would exist, yes.

Mr. Lindley: I want to have you make some diagram- for me, and I am trying to get some paper here to have you do that. And the engineers are trying to get it for me.

That is the end of the cross-examination.

The Court has seen that?

The Court: Yes.

Mr. Lindley: You may take it off.

158 Mr. Lindley: I am going to ask you Mr. Wiley to recall your testimony this morning with reference to the conditions shown in one of these raises, and the question asked you by the court just — adjournment, with reference to the south dipping vein, the north dipping vein, and the intermediate conditions there where you said that the quartz dipped vertically. Do you recall that?

Q. I wish you to illustrate that on some paper, that we will have here in a minute and I want you to indicate on that,—draw your own cross section on a pretty good scale—I want you to draw the position of all of the north and south veins in connection with *that* the part of the structure where you say that the course dips vertically.

(Drawing material supplied to witness.)

Q. Now I wish you would put down on the cross section your

understanding of the situation wherein you describe a vertical dipping quartz. You recall the instance?

A. I will do the best I can. It is a very difficult almost an impossible thing to represent that on a cross section. We will assume here that we have the north dipping vein and we have here a south dipping vein. Now they come up more or less like that, I mean to say that this intermediate ground here is silicified and mineralized and fractured in a north and south direction; now the north and south direction—this direction is north and this direction is south (indicating) so we have a view looking to the west the same as all the cross sections so far have been made. The intervening ground is a fracture in the plane on the paper, so that the mineralization and silicification have extended down in this intervening ground, and the quartz has been deposited in the way represented by the blue coloring.

I am not an artist, but perhaps that will answer.

159 Q. You are very modest.

A. Now the raises then have been made up on the one vein and some of them have been made up on the other vein, and there are a series of workings where these two series of workings are connected by a more or less horizontal cross cut, across this underlying quartz. In some cases this underlying quartz along the four hundred has been stoped or evidently has been pay, but in different places there has been litigation workings I believe, they have been termed; they have met and come up, crossed and usually start on a little incline that way, and go off on a little incline that way, as they go towards the other vein, and they form connections in this tract which underlies what we might term the top of the raise there, and they are in quartz following from one vein to the other.

Q. We have there two veins according to your theory uniting on their upward course, and the intervening ligaments or connections or zone of mineralized quartz filling?

A. Not uniting on the upper vein. This quartz which lies in between the two has no south line, so a portion of it can be referred to one vein or the other.

Q. Which portion would you say that quartz belonged to?

A. It belongs to either vein to which it is closest when it has the structure of that vein, and that condition is observable in places, but when we have the cross fractures, and the course is the same you cannot refer it to either vein; there is therefor- no hard and fast line, which separates the quartz of one vein from that of another.

Q. No wall that separates them?

A. No wall in this immediate area. That does not apply everywhere, but in this immediate fracture section.

Q. Why do you give that a vertical dip?

A. That is vertical in the mine.

160 Q. The quartz is?

A. The fracture through the quartz.

Q. The fracture through the quartz. Are those contemporaneous with the formation of the quartz, or post-mineral?

A. I don't know, some of them may have been pre-mineral, as

the fractures as a rule seem to extend up only to the wall; I don't know as to that.

Q. Well, then you did not intend to imply that a condition such as I will illustrate with a black pencil,—I am drawing what I call a roll indicated by the two parallel black lines; you did not intend to assume that any of the veins within that roll dipped vertically?

A. That the structure of the quartz often is vertical; the vein is, perhaps the vein matter you might say, has no dip?

Q. The dip is determined by the wall, is it not?

A. Yes, and this quartz, if you must give it a direction dips as a vein, strikes north and south and dips vertically.

Mr. Dickson:

Q. You are speaking of the intervening country between?

A. Simply of the intervening quartz between.

Mr. Lindley:

Q. When you come up approaching the horizontal and turn to the south that particular quartz which is in the veins stands vertically?

A. Yes, the quartz does not come up and turn over, the way the working does.

Q. In other words you have a horizontal vein?

A. No, it would be more nearly a vertical vein, if you wish to separate the quartz in the vein, possibly.

Q. But you determine a vein and its position and dip and strike by its walls?

A. Yes. That is a hard thing to explain.

Q. Can you explain it?

161 A. Well, assuming that this quartz continues down that far, only, of course the bottom line would be more or less irregular, and mineralization between the wedge, between the two.

Q. That mineralization being contemporaneous as to both the wedge and the veins?

A. Well, it doubtless occurred at different periods of time.

Q. Well I am speaking of successively; whether a successive mineralization or all at one time?

A. Very likely, I think as I said this north and south fracture are so often interrupted by that wall, that possibly that was there before, possibly the wall was there and a line against which it was stuck.

Q. You don't mean to indicate that a north or south dipping vein has a vertical dip?

A. No, certainly not.

Mr. Lindley: Take the witness. Will you kindly mark this as 'Wiley 8' and if you want any responsibility for the curved line up there, you may mark it 'L-I.'

(Sketch marked for identification.)

Redirect examination.

Mr. Dickson:

Q. Now, calling your attention to this sketch marked X-3 which you have made at the request of Mr. Lindley, does that represent occurrences which you met with in the mine in places?

A. Well, that is only a crude representation of the silicification beneath these two veins.

Q. And as I understand that intervening country is fissured and by the intervening country I mean the country lying be-
162 tween the north dipping vein and where it, or the north dipping structure and the south dipping vein with its structure is fissured, shattered, fissures cross latter-ly, at right angles to the general strike of the vein?

A. That is the condition. There is one fact in connection with that which might throw a little light on matters which I did not refer to in my direct,—down on the five hundred foot level.

Q. If you will remember that and bear it in mind I will make a note of it?

A. I just simply say the north and south fractures on that level.

Q. All right go ahead.

A. It is simply that down on this level more than one hundred feet beneath these veins, there is a cross cut which has been run, marked 539 I think.

163 Q. Be sure about it on the model.

A. 539, yes.

Mr. Lindley:

(Q.) So marked on the cross cut.

A. It is filled with quartz from its eastern end, near the drift, to near its western end. The direction of the quartz in that level is north and south, as shown by the red striping upon this cross cut, which otherwise has the rhyolite color, because the country is rhyolite there. It is the highly silicified rhyolite, and in another cross cut just north of the McQuillan shaft, the first one, we have a similar condition only not so intense.

Q. On the same level?

A. On the same level. So that we have this north and south sili'-fication shown beneath the two veins and at a distance of more than 100 feet below the 400 foot level and below either the north and south vein. That is an exceptional vein, and further away than the quartz usually occurs. If you must consider that as a distinct vein, it would have a north and south strike and a vertical depth, but it is probably an irregular mineralization in the footwall beneath the two veins.

Q. Now, I think you said in direct examination that deep down in the mine, far below the junction of these two veins, you find that the replacement of the footwall country has extended as far as 50 feet or more in places?

A. I don't know that I mentioned 50 feet. It has extended a very considerable distance, 20 and 30, and more.

Q. And when you get to the junction, and for some distance below the junction of the two veins, you have the intervening country replaced from vein to vein, from fissure to fissure?

164 A. We have.

Q. Now, that being so, would it be possible to draw any but an arbitrary line of division in this intervening country and say that all to the north of that, the replacement all to the north of that line was due to the solutions that came from the north dipping fissure, and all to the south of that, the replacement of the intervening country was due, referrable to the solutions that came up through the south dipping fissure, or would you simply have to take an arbitrary line, if the mineralization, replacement extended unbroken from one vein to the other?

A. You would have to take an arbitrary line.

Q. There is no other way of doing it. And does that explain why you, in the place that Mr. Lindley called your attention to, where in the raise marked—what raise is that now? I can not see the numbers. What raise is it on the model, or what drift is it, what work is it?

A. I think there is a case where they did not put any number on. But it is the raise which is just above the MacNamara stopes, up to the 200 level and connects with this 203.

Q. Now, you have that working colored for a certain distance in red, and changed abruptly into yellow on the model?

A. We have.

Q. And on that working has the replacement between the two veins extended from one to the other?

A. It has.

Q. And it was impossible for you to refer the mineralization at any one plane to one vein, and any other certain plane to the

165 other vein?

A. That is true.

Q. Now, I want to call your attention to the model, to a piece of work colored in yellow.

A. The top of raise 302.

Q. To the top of raise 303, isn't it?

A. 303 is the vertical part, and 302 the flat part.

Q. Between 302 and 303. That yellow piece of work yellow would appear to have a dip to the south instead of to the north. I understand from the color that that is in the north dipping vein?

A. It is.

Q. And how do you account for that apparent direction to the south? That is the direction of that piece of work in the vein?

A. That is the direction of the raise, and not the vein.

Q. That accounts for that. Now, you spoke, while under cross examination on the sketch, "Wiley X 3," that the litigation work in this intervening country, the work being curvilinear. Which side of the litigation was that on?

A. I refer more especially to the winze, raises, the cross cuts, whatever they may be termed, marked 537, 571 and 573, which were made by the Plaintiff in this case.

Q. Of course, having that—well, that explains itself. Don't need any question, I think. You can give the work driven in any direction, any shape you wish to in that mass of quartz?

A. You could.

Q. You speak of the raise 569 being the most easterly raise. Is it?

166 A. 569 is the most easterly raise that comes up from the main stopes on the west end, but there is another raise further to the east made by the West End people, which connects the stope in the Tonopah Mining Company's ground, where I now place my pointer, with raise 569, following continuously the same vein, and simply making an added connection, showing that the stopes in the West End and the stopes in the Tonopah Mining Company are upon one and the same vein. The same stopes are connected, the two points lower down, so that one now can pass continually through the stope itself.

Q. Now, directing your attention to the work at that model which is fastened on a separate piece of wood here, east of the main frame.

Mr. Lindley: I did not ask him about that. You want to take him on re-direct?

Mr. Dickson: No, but he said in answer to your question inadvertently that 569 raise was the most easterly raise.

Mr. Lindley: I did not examine him on that, Judge Dickson, but he did not seem to know.

Mr. Dickson:

(Q.) Directing your attention to that portion of the model which lies immediately east of the main frame which encloses the model, there is represented in yellow there a raise or a stope going up on a northerly dip. By whom was that work done?

A. That is work of the Tonopah Mining Company.

Q. Does that go up on the north dipping vein or on a north dipping vein?

A. It does.

Q. That was not litigation work?

167 A. That is not. That was mining work, so far as I can observe. It is being stoped in there now.

Q. Was not done by the West End Company, nor by the Jim Butler Company?

A. No.

Q. Your attention was invited in cross examination to a roll or an anticlinal fold in a little stope shown on the model in which are the figures 728 and 724. I will ask you if that roll, if it may be so dignified, is on a contact between differing rocks, or whether you have the same rocks above and below it?

A. Both sides of that are trachyte.

Q. Both the top and bottom?

A. Yes.

Q. Is one side glassy trachyte and the other non-glassy trachyte?

A. No, the workings there show that it is trachyte on both sides.

Q. The same appearance to the eye, too?

A. Yes.

Q. And is there any other feature that you know of, fissuring, slips, that might account probably would account for that anticlinal fold?

A. Well, it is not of sufficient size to properly term it an anticlinal fold. There is a little bend in the stopes, and this is on a branch of the Fraction vein.

Q. Well, is there any fissure or slip on either side of that fold?

A. There are distinct—in fact, there are three distinct fissures in that section, two especially on the north and the south, and it is meeting of these fissures which, in my opinion, make that
168 appearance.

Q. Is it anything unusual in a vein of considerable dimension such as this south dipping vein is to have irregularities of that kind in the lip of the vein, bulges, swells?

A. That is the rule rather than the exception.

Q. There was one other little place that you pointed out to us here as a fold. Where is that?

A. I did not intend to point it out as a fold. I intended to point it out as a place where the north dip was observable in a small working opposite the south dip. It is more properly in comparison with the whole thing just a pimple.

Mr. Dickson: Will you give me, Mr. Clerk, "Wiley's 5"?

Mr. Lindley: Judge Dickson, before you proceed further I have not cross examined this witness with reference to the fraction vein, nor with reference to this south vein that is out on the south. I understand that in this case neither the Fraction vein nor what we call the south vein cuts any figure, except in a geological sense.

Mr. Dickson: That is my understanding, not in this case; it will have nothing to do——

Mr. Lindley: So it is entirely irrelevant to this case, what their dip strike or anything may be.

Mr. Dickson: That is my impression. Is that your understanding, Judge Downer?

Mr. Downer: On the question of extralateral rights.

Mr. Dickson: That will come up in another suit, in which the West End Mining Company is Plaintiff, as I understand.

Mr. Lindley: Yes.

Mr. Dickson:

(Q.) Just a word or two of explanation, Mr. Wiley, of this Wiley Exhibit 5. You were asked in cross examination if this slip or fault which you spoke of was not the only thing that inter-
169 rupted or terminated or interrupted the ore at that point. And I understood you to say yes; I may be mistaken.

A. That is the only thing which interrupts the continuity of the ore at that point along that line. Of course, as a matter of fact, the south vein is interrupted by the entire width of the north vein. But this being the under side of the north vein, it is the only thing that interrupts it along that particular line.

170 Q. Well, now, after that line you encounter the top, or what you call the top of the south dipping vein on its upward course?

A. We do.

Q. And we have there the south dipping structure ceasing at that line?

A. We do.

Q. And the north dipping structure commences at that line?

A. That is what I meant to represent.

Mr. Lindley: Judge Dickson that is rather leading for your own principal witness.

Mr. Dickson: It is only in explanation.

Mr. Lindley: I am a past master in that art myself, and I do not want to make too much criticism.

Mr. Dickson: I agree with you. It depends upon the witness whether it is a leading question, or whether it is objectionable or not, on either side.

Q. Now this feature presents itself to my eye. It looks as though you had above that fault where the red coloring ceases, on this exhibit 5, or continuing upward, the same dip? I wish you would explain that?

A. That is due to the fact, as Judge Lindley says, yellow is a very bad color for that. But the yellow color is not put on heavy there because the mineralization in the ground is not intense in the main part of the north vein it is colored heavier, the structure above there.

Q. Of the fault?

A. Above the fault as indicated here, has a dip of 48 degrees to the north, whereas the south vein below has a dip right there of 49 degrees, and below of thirty degrees to the south. The raise continues up it is true in the same direction it has below, but it is in the nature of a cross cut across the north vein from the point marked 48 degrees, to blue marked on the hanging wall, marked 39
171 degrees, the entire dip there being in a northerly direction.

Q. It being a raise within the north vein?

A. That is, being a raise across the north vein.

Q. Just like the place that you referred to on the model a moment ago, where you had a raise marked yellow and apparently going down on a southerly dip?

A. Yes, a similar occurrence.

Q. Will you direct my attention Mr. Wiley to raise 366 on the model?

(Witness indicates.)

Q. That of course, I take it, is in the north dipping vein, colored yellow is in the north dipping vein?

A. That raise at the top is in the cap. A portion is in the north dipping vein and a portion of it is not colored at all, because I have never been in there and the lower portion is in the cap again. It is rather a peculiar combination.

Q. And below that you have the south dipping vein colored in red coming up?

A. Very distinct.

Mr. Lindley:

Q. Any slip in there between the two?

A. There is a line *if* slipping along back of the raise and that is probably the reason that it is so badly caved.

Mr. Dickson:

Q. Is it your opinion that this country shown on the model between raise 7,—and what number is that 302?

A. The raise is 320.

Q. That undeveloped country there owing to the erosion that had taken place, before the outflow of the andesite, the north dipping vein and the south dipping vein there would not come together on their upward course, that each would have a separate top or apex?

A. That is my opinion.

Mr. Lindley: Scored off?

172 A. Yes.

Mr. Dickson:

Q. That is all. Mr. Wiley read so much of his testimony last evening as had been transcribed and there are some errors in it and some may be due to the witness mistaking the points of the compass, using east instead of west and north instead of south. But there are other errors due to errors on the part of the stenographer. I wish the witness to be given permission and all other witnesses to read their testimony, to make the necessary corrections, and call the attention of counsel on the other side to the corrections made, and then have the stenographers take that corrected copy and correct the original record afterwards. I suppose there is no objection.

Mr. Lindley: That is always done in all cases. And particularly with expert technical witnesses, the terminology being unfamiliar to many reporters, and we always had the witness go over the testimony and make correction- and submit them to the other side. That may be done at any time before the close of the case. Is that correct Mr. Dickson?

Mr. Dickson: Yes, as it should be, I think. Call Mr. Jussen.

Mr. Lindley: One moment please, will you take the stand a moment, Mr. Wiley.

Recross-examination.

Mr. Lindley:

Q. Your statement with reference to the scoring off of this apex is an opinion statement?

A. It is an opinion statement based on the fact that if it had not been scored off, the cap could not have got down below.

Q. Wasn't it very easy to develop that fact and make it a demonstration instead of a matter of opinion?

173 A. There could have been additional work done and there has been work done that shows that the cap has been wore down but the precise line of the apex is not through there. There was, I candidly say, an attempt to develop that made by one raise, 241, and at the point where the red ceases and the violet begins they run into a small fault, and above that was the trachyte, in other words the vein was faulted, and as you dip a little further to the east——

Mr. Dickson: To the west?

A. Yes, further to the west, I would anticipate a very considerable faulting and disturbance and difficulty in actually defining any line on account of this large upwards fault.

Mr. Lindley: That is all.

Mr. Dickson: Call Mr. Jussen.

Testimony of EDMUND JUSSEN, who being called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination:

Mr. Lindley: I desire to make the same suggestion, if your honor please with reference to this witness, that he is a competent witness. We know very well of course that counsel won't accept it, but we propose to treat all of your witnesses alike.

Mr. Dickson: Well, I won't spend much time on that. I think fair to the appellate court that if the case is taken there by either side, that the court should learn from the record what the

174 experience of the witness is.

Mr. Lindley: Well the best that you can do on the examination of the witness, as to qualification, is the admission of counsel.

Mr. Dickson: Well, that is not always satisfactory.

Mr. Lindley: Not to the witness.

Mr. Dickson:

Q. What is your full name Mr. Jussen?
A. Edmund Jussen.
Q. What is your age, Mr. Jussen?
A. Forty six.
Q. Where do you reside?
A. Berkeley, California.
Q. What is your business?
A. Mining engineer.
Q. Did you study your profession at any school of learning?
A. I did.
Q. Where?
A. I studied at Freiburg in Saxony.
Q. Did you graduate there?
A. Yes sir.
Q. What degree if any did you take?

A. I took the degree of doctor of natural sciences at Zurich, Switzerland.

Q. When did you graduate?

A. 1890.

Q. Were you a citizen of this country at that time?

A. Yes sir.

Q. You are a native born citizen are you?

A. A native born citizen.

Q. How constantly have you, if at all, followed your profession of mining engineer since your graduation?

A. For the first year after my graduation, I served with the U. S. Geological Survey in connection with economic work in Florida. After that I went to Colorado and started mining at Ward Colorado. From there I went to——

Q. How long was you there?

A. I was there a year.

Q. Go ahead.

175 A. From there I took the management of the Pennsylvania mine in Summit Co. of Colorado. I stayed there until the latter part of 1893, when I went to Idaho in charge of the mines of the Idaho Company, in the interior of Idaho. From there I came to Nevada.

Q. When did you come to Nevada?

A. In 1908.

Q. What part of Nevada?

A. At Blair Nevada, as consulting Engineer of the Pittsburg Silver Peak Gold Mining Company.

Q. Were you in charge of that mine?

A. In the year 1909 I took the general managership of that company. I stayed there until the early part of 1911. Since then I have been in San Francisco and Berkeley, practicing as mining engineer.

Q. Have you examined mines in any countries or states other than you have mentioned?

A. I have.

Q. Just state briefly.

176 A. Arizona, California, Colorado, Montana, British Columbia and Georgia.

Q. In making those examinations which you just spoke about were you employed to make examination or were you simply doing it as a matter of scientific investigation?

A. I was doing it for the purpose of intending purchasers.

Q. You have made an examination of the underground workings of the West End company, that are involved in this litigation?

A. I have.

Q. How much time Mr. Jussen, have you spent in that examination altogether?

A. I made a number of trips to Tonopah. Mf first trip was made in March.

Q. Of the present year?

A. Of the present year; I suppose that altogether I have spent two month- underground in the West End mine.

Q. I will ask you, it may be a leading question,—whether that examination was conducted only by you with a view of determining if you could what was the strike of the veins found in that claim, the West End claim, the dip and the top or tops of the vein or veins as found therein?

A. It was.

Q. Leaving outside a moment the so-called fraction veins, and ommitting also what Mr. Wiley referred to as a branch of the south vein near the west end of the claim,—apart from those how many veins did you find, or do you find in the West End mining claim?

A. There are two principal veins within the west end claim. These vein- converge on their strike and dip in opposite directions; the one dipping in a northerly direction to be known as the north vein, the one dipping in a southerly direction to be known as the West End vein proper.

177 Q. You are familiar of course with the coloring on that model?

A. I am.

Q. Do you from your examination endorse the coloring there which is intended to represent the south vein throughout, as correct?

A. The coloring—The red color represents the south dipping vein, or the West End vein.

Q. Does it correctly represent it according to your examination of it on the ground?

A. It does.

Q. And state whether or not on your examination you endorse the coloring of the north dipping vein as shown upon this model, and upon the other exhibit?

A. I do.

Q. And do you also endorse the coloring on this model, upon the cross section, Exhibit G, which *are* intended to show the enclosing rock, or foot-wall and hanging-wall boundaries of the two veins wherever they have been ascertained?

A. I do.

Q. Is there anything, any feature, any point in the color scheme as adopted in the preparation of that model which does not meet with your approval?

A. There is none.

Q. How would you classify, or how do you classify, the south dipping vein and what character is it?

A. The south dipping vein is a fissure vein, properly speaking. It is a fissure vein in which replacement in the foot-wall country has taken place from the fissure proper.

Q. To what extent,—I mean now in depth of the mine, considerably below the juncture of the two fissures, does the mineralization or replacement extend; I do not mean now where it actually fades out, but where it is not highly mineralized.

A. The distance to which the mineralization has passed into the

foot-wall varies of course, ranging from two feet to as high as twenty-five feet.

178 Q. How do you classify the north dipping vein?

A. I would classify the north dipping vein as a fissure, of a similar type; it is a fissure vein in which replacement in the foot-wall country has proceeded.

Q. To what extent if at all has the process of replacement extended in the hanging-wall country of the south dipping vein?

A. The only replacement of the hanging-wall has been by solutions passing through the fissure of the south vein in places where the hanging wall has been broken by minor faultings.

Q. To what extent has that been?

A. That is observable in only a few places.

Q. What would be your answer to the same question, referring to the north dipping vein, mineralization and the hanging country?

A. There has been no mineralization of the hanging wall country on the north vein that I have observed.

Q. When you started your first examination, I will ask you if any one of these raises,—A-2; A-4; A-5; A-6; A-7, and A-8 had been put up?

A. The only raise that had been put up at the time of my first examination was raise A-5.

Q. How far had that extended upward at the time you made your first examination?

A. About twenty-five feet above the south vein, in the plane of the north vein.

Q. Did you at that time examine that raise, A-5 raise, to the extent it had then been put up?

A. I did.

Q. And in what material was it run; what did it contain?

A. The object of the examination of that particular raise there, and certain other workings on the four hundred foot level, which are in that immediate section of the ground, were to ascer-

179 tain whether or not there was a vein in that section of the ground other than the south dipping vein; 5-A at that time showed a body of quartz, a vein of quartz, extending up into the hanging-wall of the south dipping vein.

Q. The south dipping vein?

A. The hanging-wall of the south dipping vein, for a distance of twenty-five feet, dipping northerly.

Q. You do not mean the south dipping vein, into the hanging-wall?

A. I think that is right.

Q. Just step here and explain what you mean?

A. (Indicating.) This is raise 5-A; this is the south dipping vein; the country in here is the country overhanging the south dipping vein; this raise comes in to the hanging country of the south vein, but on the north dipping vein.

Q. You mean the country overlying—you don't mean that it was run up on the south dipping vein?

A. No, run up on the north dipping vein.

Q. And you refer,—or are you able to state, about the dimension of the quartz that was disclosed in that 5-A, at the time of your first examination?

A. The 5-A raise immediately above the south vein, south dipping vein, was fully two feet of quartz; four feet or five feet above this point this quartz was interrupted by a minor fault of a very considerable throw, probably five or ten inches. From the point it started on upward the quartz increased to a width of fully three feet in the then face of the No. 5 raise.

Q. That raise has been extended since that time to its present top?

A. Yes.

Q. Now how far up the raise does the fault continue?

A. The quartz continues 71 feet, up into the raise and terminates against a small fault.

180 Q. How far is that, if at all, below where that raise as shown upon the model must have encountered trachyte and cap?

A. Trachyte and cap were encountered 271 up in the raise above the hanging wall of the south dipping vein at a point indicated here by the purple in the raise immediately below the green, indicating the cap.

Q. Now did the quartz extend up to that?

A. Extended up to that point; terminated there in a small fault.

Q. Now we will take the A-2 raise, and I will ask you to describe that; what is found in there up to the point where it encounters the trachyte represented on this?

A. 2-A raise is driven on a well defined northerly dipping vein that carries quartz practically from its source into the hanging wall of the south-dipping vein to the present face.

Q. What size what dimensions is the quartz in that raise?

A. The quartz varies from one to three feet.

Q. Do you know whether samples have been taken from these various raises?

A. I understand so.

Q. You have never taken them?

A. No I have never taken them.

Q. Well go on to the A-4 raise; describe that and what was found in it?

A. The A-4 raise is also a raise on the northerly dipping vein; it carries practically continuous quartz to its present face.

Q. What dimensions?

A. The dimensions across there are from one and a half to two and a half feet.

Q. And A-6 raise? What was encountered in that?

A. That is driven on a northerly dipping vein and shows quartz a blue variety of quartz practically to its face.

181 Q. What dimensions?

A. At the beginning of the raise the quartz is fully three feet in thickness.

Q. And at the top?

A. And is somewhat smaller at the top.

Q. A-7 raise, describe that?

A. A-7 raise is driven on a north dipping vein; shows three or four feet of quartz at its beginning above the south dipping vein, but not more than six or eight inches of quartz in the face.

Q. In the top of it?

A. In the top of it.

Q. Will you describe what you encountered in this raise near the east end line of the West End claim, marked on this model 488, if my eyes do not deceive me.

A. Raise 488 is driven up on the *on the* dip of a north dipping vein; carries a large face of banded quartz and encounters the top rock near its top.

Q. Have you been up the stope or raise, whichever it may be in the Tonopah Workings, about the edge of the main frame enclosing this model, colored in yellow?

A. I have.

Q. Is that a stope or simply a raise?

A. That is a stope a part of the way and a raise the balance of the way; it is a stope for about twenty feet in height.

Q. And from the top of the stope upward to where the raise encounters the fault, what have you?

A. This contained quartz to the fault.

Q. Now we come to raise—A. I wish you would describe what is enclosed in that raise?

A. Raise—A is in the McNamara stope and starts out on a northerly dipping vein, showing quartz, not ore, quartz carrying
182 some values. It continues to its face, a distance of about forty five feet.

Q. That does not encounter the top rock?

A. No.

Q. Have you any means of determining approximately, with approximate accuracy how near the top rock it must be from the work in that vicinity?

A. Raise—B, immediately to the north of raise—A, shows the cap rock in the first fifteen feet as its height.

Q. After you get up here?

A. Yes; and raise 152 immediately south of raise—A, and part of the connection between the two hundred level and the Porcupine shaft also shows cap immediately south of raise-A so that the inference can be drawn that the cap is not very far distant from the top of raise-A?

Q. All of these raises then, except raise—A-5 in part have been done since this lawsuit was commenced?

A. Yes.

Q. And for the purpose of preparing the litigation work?

A. Yes litigation work.

Q. How does the dip of these several raises, each and all of them, conform to the dip of the north dipping vein; that is, where the raise connects with the north dipping vein, any change in dip?

A. They are all on the plane of the north dipping vein.

Q. And the ore at the bottom of the raise, or each of these raises, I will ask you is one with——

Mr. Lindley: Now I think I will have to call a line on the leading questions there?

Mr. Dickson: That is not a leading question.

Mr. Lindley: That is pretty leading.

Mr. Dickson: I asked him whether or not,——

Mr. Lindley: I am not going to make any hard and fast objection, but kindly avoid it with a witness of this man's prom-
183 inence. He does not have to be led.

Mr. Dickson: If you think that it is leading I will try and obviate that objection. I will try and observe the rule.

Q. You may take your seat again for the moment. I wish you would describe to the court giving as clear a description as you can, of the relation of the ore or quartz at the bottom of each of these raises, and up the raise, as compared with the quartz and the ore in the north dipping vein which goes on down evidently continuously from the bottom of these several raises.

A. The quartz in all of these raises on the north vein is like all of the quartz in the West End mine, it looks alike, it looks identical with most of the ore that is now being mined in the property.

Q. What is there if anything so far as your observations that can lead you to determine the question, to distinguish, or which does distinguish, the contents of a vein material found in these several raises from the vein material or ore found in the north dipping vein immediately below, and in connection with the bottom of the several raises?

A. The quartz of the north dipping vein shows banding and it shows certain littles seams of quartz of a different color, which pass over the quartz of the south dipping vein.

Q. Just pay attention to the question.

(Question read.)

A. You mean by that the difference in the quartz?

Q. I will try and put it in another way.

A. I did not get that question.

Q. What is there, if anything, which distinguishes if at all, the vein material or quartz found in these several raises and the vein material, quartz and ore as found in the north dipping vein immediately in conjunction with the bottom of the several
184 raises?

A. Why the quartz appearing in these several raises on the north dipping vein is identical with the quartz occurring in the north dipping vein beyond the blow below the bottom of these raises.

Mr. Lindley: One moment; that question has not been answered, as I understand it the answer limited itself to the quartz. Have you finished answering the question? Read the question please.

(Question read.)

Mr. Dickson: Now read the answer.

(Answer read.)

Mr. Dickson:

Q. Do you wish to add anything to that?

A. Yes. The vein material in addition to the quartz is chiefly trachyte, and it is of the same appearance below the bottom of these raises as it is in the raises themselves; the hanging-wall of the north dipping vein is prominent in all of these raises, and carries considerable clay or selvage and shows the markings that ordinarily go with that movement.

Q. I will ask you if that is of frequent occurrence through out the workings of the mine?

A. Yes, that same condition exists in the south vein; there are portions of the wall of the south vein which also show considerable clay and breccia, which has been produced by movement.

Q. Is there anything as you pass from the stope in the north dipping vein up into raise A, or from the north dipping vein up into the other raises, that have been named, to lead you to suppose that as you went into those raises you are passing out of the north dipping vein into another vein. If so, what?

185 A. Going up from the four hundred level——

Q. Do you understand the question?

A. Yes. In going up from the four hundred level to raise 494——

Q. Where is that?

A. (Indicating.) or through raise 496 over the top of the south dipping vein and into the raises given on the north dipping vein, the quartz passes through the quartz which dips south at the bottom of these raises; may I have the question again?

Q. What if anything is there as you pass from the stopes in the north dipping vein, or as you come up the north dipping vein from the bottom of these raises and pass up into the raises, to indicate when you start up those raises that you have left the north dipping vein and go into a separate vein?

A. Why the continuity of the quartz above the south dipping vein.

Q. You do not understand the question yet. Is there anything, if you will permit a leading question Mr. Lindley.

Mr. Lindley: Yes, go ahead.

Mr. Dickson:

Q. Is there anything to indicate to you as a mining engineer that when you pass out of the stope here into the south dipping vein, and go up into any one of these raises, that you have gone out of the north dipping vein into a different vein, or is it the same vein?

A. It is the same vein.

Q. The quartz that you have testified to as having been revealed by these several raises, state whether or no in them is quartz or rock in place as originally deposited, or had been dragged there to where it is now from some other source?

186 A. The quartz showing in the raises on the north dipping vein is in place, certain portions of the quartz near the foot lines show that it has been fractured and dragged more, but generally speaking it is all in place.

Q. This No. 5 raise which you say was there when you first commenced your examination—did that look then like new or old works?

A. Old work.

Q. You say that was the only raise of those mentioned that had been put up before your examination. I want to ask whether or not you know raise 488 above raise 569?

A. Raise 5-A was the only raise above the opening, 400-B stope. Raise 488 at this point had been put up half way before I made the first examination.

Q. About how far?

A. About thirty-five feet.

Q. Did that look then like new work?

A. It was old work.

Q. It was old work also?

A. Yes.

Q. And state whether or no for a distance that it had then been driven out it was on the north dipping vein?

A. It was on the north dipping vein.

Q. I wish you would describe the appearance of the hanging wall of the north dipping vein as it passes above the top of what you call the south dipping vein,—whether it is well defined or not?

A. The hanging-wall of the north dipping vein as it passes from the south dipping vein is well defined.

Q. Explain its appearance as best you can to the court?

A. It carries considerable gouge and attrition matter and quartz; quartz that is banded parallel to the hanging wall itself.

Q. Speaking of the country interveining between the two veins the north dipping and south dipping veins, at the plane of junction and for some distance below that junction—explain to the court the extent if at all that it has been replaced?

187 A. The country underneath and between the north and south dipping veins has been mineralized, or rather silicified for considerable distance; this section of country extending between the 7-A raise on the west and the 488-raise on the east is a country of intense silicification, it is in that section of the country that the silica has extended in places to from one hundred feet in the veins themselves, into the foot-wall country.

Q. To what extent immediately below—what I mean by immediately below the plane, the junction of these two veins, we will say forty or fifty feet below, to what extent has the intervening country between the two veins been replaced by the mineral bearing solution?

A. The country immediately underneath the south dipping vein has been replaced for a varying distance in places as far as forty feet; the replacement on the hanging wall also reaches into the foot-wall fifteen or twenty feet.

Q. Well, is there any place below the point of junction of the two

veins, where the intervening country has been replaced from one vein to another?

A. Yes.

Q. That is what I wanted to get at. Did you observe the character — the condition of that intervening country? We will say thirty, forty or fifty feet below the line or plane where these veins unite; have you observed the condition of the intervening country,—I mean by its condition, is it solid or broken or fractured appearance?

188 A. Yes. The country intervening between these two fissures has been sheared by fissures running practically north and south, having a slight dip to the east.

Q. Extending nearly vertical, do you mean?

A. Extending nearly vertical.

Q. Can you state from your observation or your knowledge and experience as a mining engineer whether or no, in a rock that was at all soluble so that it could be affected by the mineral metal bearing solutions, giving effect thereby to the replacement, conversion of the country rock into ore, whether you would expect such replacement to extend farther from the main channel of circulation, where the country was broken, fissured, than you would if it were solid, unbroken?

A. The replacement of the country rock between the fissures has proceeded along fracture lines, and through the—and gradually replaced the rock itself.

Q. I understand. My question is whether you would expect the process of replacement to extend further out into the footwall country, or the country rock where that rock was broken and fractured, than you would if it were solid and unbroken?

A. Why, most assuredly.

Q. Have you investigated with care, Mr. Jussen, the places where observation was possible, the appearance of the south dipping vein where it came in connection with, or joined the north dipping vein?

A. Yes.

Q. Describe some of those places where you have observed them?

The Court: Mr. Dickson, that is a new subject, and it is

189 recess time. Do you want a recess?

Mr. Dickson: I would like a recess, yes.

The Court: This case is continued for ten minutes. You may declare a recess for that time, Mr. Bailiff.

(Short recess taken.)

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson:

(Q.) Are you feeling all right now?

A. All right now.

Mr. Dickson: Read the last question.

(The reporter read the last question.)

Mr. Dickson:

(Q.) And show what the structural conditions of the two are?

A. The south dipping vein stops against the north dipping vein, then at the bottom of all of the raises that have been driven between the east end line of the West End claim, and the last westerly raise, driven from head of the MacNamara stope.

Q. Called raise A?

A. Called raise A. The stopping of the South dipping vein against the north dipping vein is simply the ending of the south dipping structure against the north dipping structure.

Q. What difference in structure of the two veins do you have in such places?

A. The only difference of structure is that one dips north, the other one dips south. The quartz in both veins is identical.

Q. Is that an abrupt or gradual change from a southerly
190 to a northerly dip?

A. That is an abrupt change from a southerly to a northerly dip.

Q. Has there been in any of these raises clear up to the top of them any considerable, or any oxidization that you have observed?

A. That is no oxidation that I have been able to observe in the top of these raises.

Q. How is it throughout the mine, generally, in that respect?

A. It seems to be—whatever oxidation is found in the mine seems to have occurred without any particular rule or reason. You may find in the heart of a body of ore an oxidized portion, an oxidized streak. Then again, you may find a certain amount of oxidation in connection with the Brougher dacite cut in the western portion of the mine.

Q. Where, if there is any place where you would observe a greater amount of oxidation than elsewhere in the mine, point it out?

A. The only places of greatest oxidation in the mine occurs on the 600 and 500 level, where the workings pass into the Brough-Mountain dacite. There is very litle oxidation shown in the vein proper.

Q. Apart from that?

A. That is not ore, that is country rock cut by this.

Q. I am speaking more particularly of the ore, the vein matter?

A. There is so little oxidation that it is a very difficult thing to tell where most of the oxidation took place.

Q. There have been some major faults spoken of here, such as the Edwards fault?

A. Yes.

191 Q. And the buried fault. State whether along the plane of either one of those major faults there is any evidence that surface waters, as well as the air could come down through the faults?

A. There is a little evidence of oxidation in a north and south striking fault which cuts through a cross cut driven from the 500 foot Tonopah level, and which shows in certain portions of the Jim Butler workings. Within that fault there is some evidence of

oxidation and the fault itself seems to carry—the fault itself carries a great deal of water.

Q. How is that?

A. The fault itself carries a great deal of water.

Q. That would be surface waters, of course?

A. Surface waters. But there is in other places, there is very little oxidation.

Q. Where you have that channel of circulation for the surface waters, that particular fault you are now speaking of, of course, that would give access—there would be access for the air, too?

A. There would.

Q. To what extent does oxidation go on there? Is it limited or extensive?

A. It is limited. It affects simply the rocks cut by the fault in the immediate vicinity of the fault.

Q. Have you formed a conclusion, or reached a conclusion as to what the strike of the south dipping vein is, Mr. *Mr.* Jussen?

A. The strike of the south dipping vein is about 10 degrees north of east and west.

Q. True or magnetic?

192 A. True.

Q. And what, in your opinion, is the strike of the north dipping vein?

A. The strike of the north dipping vein is about 40 degrees south of east and west.

Mr. Lindley: One moment, where is he taking these strikes, at the nearest point to the surface, or on a level?

Mr. Dickson: I was speaking generally of the underground workings.

Q. Take it at the top, as far as it can be determined at the top, about what would be the strike of the south dipping vein.

A. You mean where the south dipping vein joins the north dipping vein?

Q. Yes; taking it through its extent, so far as the top is developed. Get at it this way: what is the general strike, take it at its westerly end and easterly end, as disclosed, what is the average strike of the south dipping vein at the surface?

A. The average strike of the south dipping vein, taken along the line where it adjoins the north dipping vein is about 10 degrees south of east and west.

Q. So you are speaking of the plane of junction when you give——

Mr. Lindley:

(Q.) South of east and west?

A. South of east and west, that is, if one may express it that way. Express it that the strike of that vein from the top of the MacNamara stope to where it crosses the east end line of the West End vein is about south 80 degrees east.

Mr. Dickson:

(Q.) And the strike of the north dipping vein as to plane
193 of junction is about what?

A. The strike of the north dipping vein at the plane of junction is about the same.

Q. About the same as what?

A. The same the strike of the south dipping vein.

Q. What is the average dip of the south dipping vein at the west end of the development?

A. The average dip of the south dipping vein at the west end of the development is about 30 degrees.

Q. And what is the average dip of the south dipping vein at and in the vicinity of the east end line of the West End claim?

A. About 17 degrees.

Q. And about what is the dip of the north dipping vein, so far as that vein has been developed?

A. The north dipping vein, near the east end line of the West End claim, dips approximately 17 degrees.

Q. How much?

A. 17 degrees.

Q. Have you reached a conclusion, Mr. Jussen, as to where the top of the south dipping vein is?

A. The top of the south dipping vein is underneath and adjoins the north dipping vein, and continues from the east end line of the West End claim to and beyond the raise "A," driven from the head of the MacNamara stope.

Q. And where does it go then?

A. It passes from there into—or passes from there a short distance in a westerly direction to a termination against a mass of eruptive rock.

Q. Does it cross any other line of the West End claim
194 than the east end line at its top?

A. It crosses the north side line of the West End claim.

Q. Have you made any attempt to fix approximately at what distance from the east end line, measured along the north side line, that vein and its top crosses the north side line of the claim?

A. I have simply endeavored to determine the place on the north side line where the south dipping vein crossed the north side line of the West End claim. The distance on the side line from any one of the corner- was not measured by me. That was given to me by the engineer—the distance of that point from any one of the points.

Q. Can you point out on the model approximately where, in your judgment, the south dipping vein at its apex crosses the north side line of the West End claim?

A. About 8 feet north of the foot of the 150 raise.

Q. I will ask you if between raise 7A, and what raise is this?

A. 302.

Q. The top or apex of either the south dipping vein or the north dipping vein is disclosed, actually disclosed, uncovered?

A. There are no workings actually disclosing the top of that in that distance.

Q. That would be a matter of calculation from the places where it has been disclosed on either end to determine whether the top of either of them would be found in that place?

A. It would.

Mr. Dickson: You may cross examine.

195 Cross-examination.

Mr. Lindley:

(Q.) Mr. Jussen, you are somewhat of a geologist, as well as a mining engineer?

A. I have done some geological work, but principally such geological work as pertains to structural problems.

Q. Do you make a specialty at times of rock examination?

A. I do not.

Q. You have in the past, have you not?

A. I have made rock examination, yes.

Q. Have you made any thin sections of these rocks?

A. Not personally.

Q. You have not personally?

A. Not personally, no sir.

Q. Take cross section B. You there have a read and a yellow vein. Will you tell us how that happened?

A. Well, if you want to indulge in speculative geology, I think that I can give you my views on the subject.

Q. Well, I would like to have your views.

A. A certain strain brought about in the trachyte rock mass West End through the introduction or intrusion of *waste under* rhyolite. These strains brought about a formation of a fissure, the south dipping fissure. As these fissures continued, a north fissure was formed projecting up and beyond the south dipping fissure.

Q. They were not formed at the same time?

A. I think not. They may have been fissures formed during the same cycle of fracturing, but not at the same time.

Q. Well, is it your idea that this represented in red here
196 was formed first and stopped there?

A. I do.

Q. And then this other fissure was formed and stopped there?

A. Went beyond; for the reason that it reached—I beg your pardon, I will stop my answer right where it was.

Q. Well, you do not care to indulge in any further speculating geology at that point?

A. I simply carried it to that point.

Q. We are in a homogeneous rock there, aren't we?

A. In that particular section, you are in a trachyte.

Q. Then, as I understand you, the fissure up to the blue line was first formed?

A. Yes.

Q. Then, this other fissure was formed?

A. Yes.

Q. When was it mineralized?

A. I think that the south vein was probably mineralized prior to the formation of the north dipping fissure.

Q. Separate periods of mineralization?

A. Yes.

Q. Was there any—in other words, the south dipping fissure was mineralized before the north dipping fissure was formed?

A. It has that appearance, through the structure that is shown where the south dipping fissure terminates against the north dipping fissure.

Q. Now, at that point of termination, is there any faulting?

197 *Q. Now at that point of termination is there any faulting?*

A. There is faulting but it is minor.

Q. Does it displace the vein?

A. I should say not.

Q. It does not?

A. Not in the plane of the vein.

Q. There is nothing to indicate a physical and distinctive origin of the two on the ground?

A. There are fractures which are parallel to the course of the north dipping vein against which the south dipping vein terminates.

Q. Is it your idea that that is all there ever was of the south dipping fracture?

A. It looks that way to me.

Q. In other words in an upward direction to be followed, that crack simply extended up there and stopped?

A. I think that north dipping vein never extended much further than it is shown in the workings now, the south dipping vein.

Q. In other words that crack terminated there, and there was another dynamic force which began?

A. Another dynamic force of the same course or another period which created the same fissure.

Q. When you are speaking of contemporaneous origins, do you think they are contemporaneous?

A. I do not. I think they are of the same time.

Q. Is there any evidence of movement of the secondly formed fissure as against the vein cutting off this vein or coming up against it?

A. You mean on the plane of the north vein?

Q. Yes.

A. The hanging wall of the north vein shows a heavy gouge which is unquestionably the result of movement.

Q. Is that shown in connection with the south dipping vein?

A. The south dipping vein does not show as much gouge

198 as a rule — north dipping vein.

Q. Is there any gouge along the plane of faulting between the two?

A. There is very little gouge; you will find occasionally in the course of the vein, the course of the points of joining that there is a small fault or throw which may be four or five feet but beyond that there is no extensive faulting.

Q. I have reference particularly to the place where you say that this original mineralized vein was first formed, and the first mineralizing ceased, and a subsequent fissure came up, against it. I am asking you along the first terminal edge of that vein if there is any sign of a movement?

A. There is a little gouge shown in places.

Q. I am confining you directly to the plane formation between the walls?

A. That is what I am referring to.

Q. There is gouge there?

A. There is in places.

Q. At that particular point?

A. At that particular point on that section there are one or two small gouge seams.

Q. The gouge is not continuous?

A. No, I should say that in the next raise the seam which shows in this particular line or section might not occur above.

Q. Might not occur at all. How is it about the gouge in these raises that were cut up? Any gouge there?

A. There is a little gouge in foot of the raise, just above the south dipping vein, but that gouge belongs to a fault or a series of faults, that strike in a northerly and southerly direction.

Q. We will turn to another cross section. Cross section C;
199 you have a vein painted red and one painted yellow, can you tell how that happened?

A. Precisely the same way that the other fissures were formed.

Q. Well, this cutting off of this south dipping vein that you spoke of shows clear along the strike of that vein does it?

A. Every place that I have observed it.

Q. Clear along that strike?

A. Yes.

Q. There must have been some extensive movement there?

A. Not necessarily.

Q. In other words you confine these things in just this juxtaposition without any serious movement?

A. I can understand how two fissures can be foremd, and not——

Q. We were dealing in the last cross section with homogeneous rocks, where the two fissures were made. I now call your attention to section C where apparently on the line of contact between,—that happened in the same way?

A. I should say so; the fissures in their course struck the line.

Q. In other words a fissure strong enough to throw out into the hard eruptive rock passed and crossed this south vein, without showing any attrition at the point where they crossed?

A. I don't believe that we understand each other.

Q. Well if you cannot answer my question it is your privilege to say so. Will you please read my question Miss Reporter?

(Question read.)

Q. Can you answer the question?

A. I can.

200 Q. Please answer it?

A. I don't see why there is not a termination to every fissure at their depth; a fissure is simply nothing but an expression of a series of tensions, the *the* result of the expression of tension in rock; now when that tension ceases the fissure ceases. That fissure need not extend indefinitely in the supra imposed country. Now as a relation to the north dipping vein which in that portion, its course follows the contact of the rhyolite and trachyte, I could say that the fissure could very readily extend to and above the south dipping fissures without very much faulting. It can be a fissure without any material displacement.

Q. Are you satisfied with that answer?

A. I am.

Q. Have you studied the system of faulting in connection with the origin of these veins, or their present status with reference to faulting?

A. I have studied faults of the mines, and their relation to these particular veins.

Q. Did you ever hear of a fault called the palaris fault?

A. I have.

Q. Where is it with reference to this vein?

A. I think that the palaris fault is simply a term that was at one time given to the north dipping vein.

201 A. Well,—never in a public manner that I know of.

Q. Never heard of that term Polaris fault by the employees of the West End Company?

A. I have, in a joking way.

Q. In a joking way?

A. Yes.

Q. Did you ever hear of a fault called Siebert?

A. I have heard of such a fault.

Q. Have you ever read about it?

A. I have read about it.

Q. You have read Mr. Spurr's monograph on this district?

A. I have, some years ago.

Q. Not in connection with the trial of this case?

A. No.

Q. Have you read Mr. Burgess' monograph on this district?

A. I have.

Q. In a recent period?

A. No; about a year ago.

Q. Is there any major faulting in your examination in this mine that at all affects, according to your observation, this vein in any way, shape or form?

A. There may be, but it is not in the plane of the north dipping vein.

Q. You do not think that all your upraises here run on a fault plane?

A. I do not.

Q. You are quite certain of that are you?

A. I am perfectly positive.

Q. Have you ever undertaken to trace the line of the wall that is exposed in those upraises out into any other section of the
202 country?

A. Nothing beyond the workings of the Tonopah Mining Company, adjoining the easterly end lines of the West End claim.

Q. Ever undertake to trace it out into the west country?

A. Not into the crater which terminates the MacNamara stope on the west.

Q. Crater? Have we a crater there?

A. A little mass there of eruptive material that unquestionable is the product of eruptive activity.

Q. I do not under-tand your designation. What do you mean by a crater?

A. A volcano.

Q. The neck of a volcano?

A. A portion, not necessarily the neck.

Q. The crater is usually the mouth where the molton lava is poured out.

A. That is true.

Q. Do you consider this a crater in the sense that that is where the molten lava was poured out?

A. Not the neck necessarily that particular part; it may have been part of the lava that was poured out from a neck located somewhere else.

Q. It may be an eruptive and not a flow?

A. It may be a flow and not necessarily a crater.

Q. You have not undertaken to follow out these walls out into the west country?

A. Not at all.

Q. That vein terminates abruptly?

A. In the westerly portion of its course.

Q. That is true of the veins, both north and south?

A. True of both the north and south veins.

203 Q. That is the end of it?

A. That is the end of the vein, north and south; the north vein continues considerably further to the west than the south dipping vein.

Q. Cutting something in the form of a crescent, in a rough way?

A. In a rough way, yes.

Q. Is that all you know about the dynamics in these faults that you have now explained with reference to these veins?

A. The appearance of the north vein,—the question of simple faulting on the plane of that vein has been investigated by me in a rather thorough way; I fail to see there has been very much displacement on the plane of the north vein, either overthrows or faulting.

Q. You were asked on cross-examination about an illustration as to the included mineralization between the two veins. That mineralization does exist between the two veins and extends from one to the other?

A. In place.

Q. Where did that mineralization come from?
A. From the fissures themselves.
Q. Which one?
A. Either of the two, or both.
Q. And that condition prevails to what extent throughout the mine?
A. It is common with the summit of these two veins; that is, to all the ground or rock that immediately underlies the summit of the north and south veins.
Q. Do you find the same conditions existing along the foot-wall in the Jim Butler-West End workings in the west end of
204 the mine?
A. There is very little of that silicification in the west end of the mine on the lower levels in the foot-wall country.
Q. Do you know the 712 cross-cut in the east section of the country?
A. I understood you in the west section of the country?
Q. Yes, in the west section too.
A. The 712 cross-cut,—yes.
Q. You find the same condition there?
A. I find that *that* this place where you speak of shows that the silicification is a part of the south dipping vein.
Q. Well, take that entire cross-cut, under the stopes, or beyond the stopes; do you find the same situation as to mineralization there as you say in this iilustration between and underlying the two veins?

Mr. Dickson (int.): You mean extending from one vein to the other?

Mr. Lindley: No; underneath the south dipping vein, in the hanging wall of the section; either in the hanging or the foot.

A. Of the West End vein, or the Jim Butler vein?
Q. Well, the Jim Butler vein, we think it is; the south dipping vein. Don't you find that same silicification, mineralization and condition in that section of the mine, in the hanging country, that you have testified to as existing underneath what we call the crest of the anticline?
A. I have not found any silicification in the foot-wall or hanging-wall of the West End vein in its downward course only in
205 such place where separate and branch veins have been cast off by the south vein.
Q. Do you recall what you saw going through that 712-cross-cut?
A. I do.
Q. And do you now state there is not anything in there except barren country rock?
A. This stope here, is a portion of the vein proper.
Q. Take the cross-cut throughout its entire length.
A. This portion of the cross-cut, the end, practically, of the cross-cut, 712,—there is considerable silicification back in the foot, but that is not in any way connected with the immediate foot-wall of the south dipping vein.
Q. Well, it is somewhere near the vein, isn't it?

A. Vertically, I should say, 40 or 50 feet below it.
Q. Connected with the vein, isn't it?
A. Not that I know of.
Q. Well, there is no opening there?
A. No opening that I can see.
Q. Well, is it your opinion that it is connected with it?
A. I would not venture that opinion as there are several places in the West End and in the Butler ground where there are masses of silica that are not necessarily connected with either vein.
Q. You would not venture an opinion on that?
A. No.
Q. When you say these two veins come up together abruptly, what do you mean?
A. I mean one terminates abruptly against the other.
Q. Well, what do you mean, abruptly, as to angle?
206 A. Well, the south dipping vein,—the structure of the south dipping vein terminates against the structure of the north dipping vein.
Q. Any difference between those two structures?
A. No material difference.
Q. Any difference in the vein filling?
A. Both of them are banded quartz.
Q. Any difference in the vein filling of the two veins?
A. None.
Q. Could you tell either of them apart unless you knew where they came from?
A. No.
Q. Now I wish you would examine these stopes up here in the west end of the mine, in the neighborhood of what is marked here "Raise A," where I find the yellow and the red joined here by a line. Is that an arbitrary line or does it designate a distinct physical parting between the two? I am calling your attention to the line of demarcation between the red and yellow in the stope underneath Raise A.
A. There is a little faulting of the hanging wall at that place.
Q. How do you designate faults on this model?
A. In blue.
Q. There is no blue mark there?
A. No, but there are a number of other faults that occur that probably are not marked on this model,—small faults.
Q. That line of parting exists,—you are sure of that?
A. There is a line of parting there.
Q. And on that line?
207 A. Practically on that line.
Q. Practically on that line?
A. Yes.
Q. You call that an abrupt intersection as indicated by the line connecting the red with the yellow. Is that what you mean by an abrupt intersection?
A. No, not at all.
Q. That is not abrupt there?

A. No.

Q. Tell me a point in the mine where it is abrupt.

A. In either one of the raises above the 400 G stope,—raises 2A, 4A, 5A, or 6A, or in either of the raises below the 400-ft. level of the eastern portion of the property.

Q. Raises 571 and 573,—is that abrupt?

A. Raises 569, or 573, is an abrupt termination.

Q. Is that any more abrupt than the termination in the west end of the MacNamara-West End stope?

A. It is.

Q. Is there a physical line of demarcation there?

A. Yes, there is a line of physical demarcation.

Q. What is it?

A. Simply the end of quartz of one particular structure as against the dip,—as against the quartz of the other structure and dip.

Q. I understood you to say there is no difference in the structure.

A. There is not.

Q. How can you tell when one structure begins and the other ends?

208 A. I mean as relates to the dip?

Q. In other words, they are different veins because they have different dips?

A. That is not the only difference.

Q. Then, make your explanation. I asked you how you could tell where one structure met another and there was no difference in the structure, how you could determine there were two?

A. The structure of the north dipping vein is in parallelism with the hanging-wall of the vein; shows a decided banding. The south dipping vein,—the structure of that is also parallel to the south dipping vein. Now when these two met and the dips changed, when they met and terminated one against the other, there was a seepage of one as against the other.

Q. How do you know that they met?

A. It is visible in the mine.

Q. Because there is a change in the direction of the dip?

A. Not only a change in the direction of the dip, but a change in the dip of the structure.

209 Q. Well, there must be a change of the dip of the structure if there is a change in the dip?

A. That is right.

Q. Obviously?

A. Yes.

Q. I cannot appreciate—Perhaps you have a clear notion of what you are testifying to, but I have not been able to get it through my head yet. I want to know what there is there to indicate that that is two veins instead of one vein?

A. As you pass up on the plane of the south dipping vein the quartz shows a banding parallel to the hanging wall of the south dipping vein. When you reach the north dipping vein, this banding of the South dipping vein quits against the north dipping banding of the north vein.

Q. How do you know it quits?
A. It is visible, plain to be seen.
Q. In other words, there is a change in the direction?
A. Change in the direction.
Q. Is there any physical interruption?
A. Nothing more than a slight breaking of the quartz.

Mr. Lindley: That is all.
Mr. Dickson: That is all. I may have one or two questions in the morning. I do not know that I will. It is hardly worth while calling another witness.
Mr. Lindley: One moment, please.

Q. What do you understand to be the meaning of the word "strike"?
A. It is the course of a vein on a level.
Q. Course of a vein on a level. Is this apex tracing of yours on a level?
A. No.
210 Q. It is a plunging line, isn't it?
A. It is an easterly dipping line. It is a line such as you would naturally expect would be the line of intersection of two converging planes.
Q. Well, it is not a course on a level?
A. No.
Q. And when you use the term "strike" in connection with your testimony, you mean the strike of the vein on a level?
A. I mean——
Q. The course of a vein on a level?
A. At right angles to the dip.
Q. There is a difference, then, is there not, between a course and a strike?
A. Well, the term has been used in the same sense.
Q. Well, the course of a vein on a level and a strike are coincident?
A. I should say that the strike of the vein was the intersection of the plane of the vein with the horizontal plane—the line of intersection of the plane of the vein with the horizontal plane.
Q. The course on a level?
A. Course on a level.
Q. It must be if you are on a horizontal plane?
A. Yes.
Q. And then the course of this apex is downward—If that mountain, the original surface was restored there, you would find the apex tracing going up hill from the east to the west, wouldn't you?
A. If that mountain were restored there——
Q. If the cap was taken off?
211 A. The apex line would be practically horizontal; have a very much slighter dip to the east than it has now.
Q. By removing the capping, you will say that it would be horizontal?

A. The capping simply accompanies the faults that have created the minor distortions in the veins.

Q. Well, how does that help us out? What is your conception of this thing in the original, that these veins were created before this trachyte flow, is that right?

A. No, I don't think they were created before the trachyte flow. They are in the trachyte in places.

Q. Well, what is your last rock, your andesite? What do you call your capping?

A. There are two forms of capping; one is an andesite and the other is a dacite.

Q. Well, I should have said dacite; the Brougher Mountain dacite, you call it?

A. Yes.

Q. That was your last flow, and that flowed from the surface, didn't it?

A. It did.

Q. And that surface is now represented by what on this model?

A. By the lighter green color.

Q. By a lighter green color. Well, isn't it apparent from that, if you take that capping off now and restore those conditions, that your line of apex ascends up hill from the east to the west of your so-called apex?

A. The line of intersection of the north and south dipping veins must, necessarily, ascend going West.

Q. Well, then, it does. That is what I asked you sometime ago.

212 A. The line of intersection of any two converging planes is bound to drop in one direction. If they were parallel it would be a horizontal line.

Q. Well, can't you conceive of two veins coming up and the course of the intersection being absolutely horizontal?

A. If they are parallel.

Mr. Dickson:

(Q.) Parallel in strike, do you mean?

A. Parallel in strike.

Mr. Lindley:

(Q.) But the strike of one vein in this case is the strike of the other?

A. Not at all. They are converging strikes.

Q. Well, I understood you to define the strike of the red vein,—first define the strike of the yellow vein and then the red, and then I understood it was the same. Didn't you so state?

A. I did not define the strike of the yellow vein as being in the same direction as the strike of the red vein.

Q. Then I misunderstood you.

A. I said they are converging veins.

Q. So they converge on their upward course, and, according to your notion, they converge on their strike?

A. On their strike at an angle of forty degrees.

Mr. Lindley: I may have a question or two in the morning. It is now the adjournment hour.

The Court: This case is continued until to-morrow morning, at ten o'clock.

213 5.

Third Day, Morning Session.

T-URSDAY, December 10th, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

Mr. Dickson: Call Mr. Chandler.

Testimony of JOHN W. CHANDLER, who being called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

Q. What is your full name Mr. Chandler and your age?
A. John W. Chandler. Age thirty-eight.
Q. Where do you reside?
A. Tonopah.
Q. How long have you lived here?
A. Altogether about eight years.
Q. What is your business?
A. I beg your pardon?
Q. What is your business?
A. Mining Engineer.
Q. Where did you study your profession?
A. School of mines of Colorado.
Q. Did you graduate from that school?
A. I did.
Q. When?
A. 1901.
Q. How constantly have you followed your profession since your graduation?
A. I have followed it constantly since that time.
214 Q. Where first?
A. In Colorado for a short time. In Utah for a short time and since that time in California and Nevada.
Q. What mines in Utah?
A. A mine called the Midas, in the Deep Creek country.
Q. *Are* others in Utah?
A. Any others you say?
Q. Any other mines in Utah?
A. I was not connected with the management of any other.
Q. Did you examine any other mines in Utah?
A. Yes, a number.

Q. And from Utah where did you next engage in the practice of your profession?
A. In California.
Q. How long in California were you so engaged?
A. About two years.
Q. And do I understand that from California you came to Nevada?
A. I did.
Q. And in what portion of Nevada have you practiced your profession chiefly?
A. In this camp.
Q. In Tonopah?
A. As far as the operating end in concerned.
Q. You have examined mines I take it by that elsewhere in the State?
A. Yes, throughout the state.
Q. Your operating experience has been practically in the Tonopah District?
A. Yes.
Q. When did you first come here Mr. Chandler? When did you first engage in the practice of your profession?
A. In Tonopah? I think about the latter part of 1904. I would not be certain as to that date.
Q. And continuously since that time?
A. No I have been absent from the camp for about three years, returning a year ago last October.
Q. With the exception of that three year period you have
215 been engaged in your profession here?
A. I have, since 1904.
Q. Have you examined many of the mines in the Tonopah District?
A. Yes.
Q. Most of them?
A. Yes, most of them not in the nature of a complete examination of course, but I have been underground in most of the mines of the camp, and have spent considerable time in some of the properties.
Q. What was your purpose or object in visiting or examining the other mines, which you were not directly connected with?
A. To learn the general conditions of the camp, and the geological conditions of the camp.
Q. How many mines have you had charge of in Tonopah?
A. Well, I have had charge of the McNamara the West End, Halifax, North Star, Rescue, and have been retained at different times in an advisory capacity in some of the others, smaller properties.
Q. How long had you charge of the McNamara operations?
A. Roughly speaking for about six years.
Q. How long?
A. For about six years as near as I can recollect.
Q. You are employed by the defendant the West End Company, at this time?

A. I am.
Q. In what capacity?
A. As general Superintendent of the West End property.
Q. How long have you been employed as the General Superintendant of the Defendant company?
A. Since last October.
Q. Prior to that time had you been employed by the West End Company?
A. I had.
Q. In what capacity?
A. In an advisory capacity, and to take care of examination work on the outside.
Q. Examination work what?
A. On the outside.
Q. What do you mean by that?
A. Outside of the camp.

216 Q. Were you employed by the defendant company to examine this mine, its mine and its works with a view to testifying on its behalf in this case, if the result of your examination and your judgment would enable you conscientiously to do so?
A. I was.
Q. When were you so first employed?
A. My employment continued with the West End Company. At the time that this suit was instituted, a different arrangement was made along the lines that you have just stated that I was to examine the property carefully, and if I could after a certain amount of work was done, conscientiously enter the case in behalf of the company I was to do so.
Q. So you have been employed in that capacity since about the time of the commencement of this action?
A. Yes, sir.
Q. And how diligently, how much of the time have you devoted to an examination with this end in view?
A. Well I have devoted considerable time. I do not know just how long. I expect in examining underground, perhaps I put in what would amount to several weeks' time.
Q. From your—Apart from your——
A. Regular duties since October first.
Q. Since that time I take it that you have been in the mine constantly?
A. Yes.
Q. Directing operation?
A. Directing operations, yes.
Q. Mining operations, regardless of any litigation?
A. Yes.
Q. And also observing the conditions in the mine with a view to the litigation?
A. Yes.
Q. I take it that your examination was made with a view of

ascertaining, if you could from the development, what you believed to be the course, direction or strike of the veins found in that mine, their dips and their tops, or apices.

A. Yes, that was necessarily a part of that work.

Q. Apart from the fraction vein that has been referred
217 to by the witnesses who have already testified, and also apart from what has been referred to as a branch of the south dipping vein near the west end of the West End Mining Company claim, how many veins did you find in the West End claim?
218 A. Three, so far as developed.

Q. Three, apart from the two that I have mentioned?

A. Yes.

Q. You are familiar of course with this model?

A. I am.

Q. Do you know what is meant by the witnesses when they refer to the south dipping vein?

A. I do.

Q. And the north dipping vein?

A. Yes.

Q. I wish you would indicate to the court what is the course or direction of the top or apex of the south dipping vein. You may step to the model if you desire to do so?

A. The general course?

Q. Just one moment.—You may proceed, you have the question in mind have you?

A. Yes. The general course of this line is easterly and westerly.

Q. Between the raise which has been referred to as 7-A and 302 I understand that the top or apex of neither the south dipping vein nor the north dipping vein has been developed, disclosed?

A. That is correct.

Q. And where it would be, where the top for instance of either of those veins in that section would be, could only be calculated by its position at either end where it is found, at either end of that section and from the general dip and the course of each of the veins.

A. Yes.

Q. Will you point out on the model Mr. Chandler in such detail as you can where you found the top of the south dipping vein; where its top is found in your judgment? Starting at the east end or west end whichever you prefer?

A. The top of the sou-h vein is found or is shown in a series of raises at juncture with the north vein. The change of color on these raises indicate these points.

Q. The uppermost edge of that is colored in red on this model, and as I understand represents in your judgment the top or apex of the south dipping vein?
219 A. It does.

Q. State whether or no in your judgment, the north dipping vein in its course upward extends above to the top of the south dippung vein, or whether there is but one vein there having an unbroken roll for its crest?

A. There are two veins, and in all of the raises above the junctures with the south vein, show the north vein to be continuous to the point shown, well defined, unbroken, that is as to hanging wall tracing.

Q. I will ask you to point out the raises that you refer to starting at the east end and going westerly; describe each raise and go into such detail as you think is necessary to give as clear a picture as can be given in words. What is found in each one of those raises?

A. On both veins?

Q. No, on the north dipping vein.

A. Well, taking the most easterly raise first, the 488, near the east end line of the West End claim, that raise follows the north vein to the top of the raise continuously.

Q. Now, with reference to the north vein, does—where is the foot of it, in the north vein?

A. The hanging wall of the north vein is exposed there near the foot of the raise.

Q. What is encountered in that raise?

A. The raise follows the north dipping vein with varying widths continuously to the top of the raise.

Q. Does it reach cap rock at the top?

A. Yes, it reaches cap rock at the top.

Q. In the roof?

A. In the roof; it is not cut off; the raise has not been run as far as the vein continues.

Q. There is still vein in the face?

A. There is.

Q. I wish you would describe the dimensions of the quartz as best you can, disclosed in that raise 488?

220 A. The width of the vein varies considerably; there is at least three to four feet of quartz at the lower end of it. And varying width to the top. The vein is considerably smaller in the top of the raise.

Q. About what width of quartz have you there?

A. Oh, as I remember it it is a foot or more; at least a foot.

Q. How does the quartz and vein material which is disclosed in that raise, and the other raises, compare in appearance with the quartz and vein material, further down in the north dipping vein?

A. There is to me no observable difference in the quartz or the vein in any of those upraises below the juncture, or the quartz further down in the same vein.

Q. Have you with you a sample taken from anywhere on the north dipping vein?

A. I have.

221 Q. Just produce it? Q. Is that marked in any way?

A. Marked "C" I.

Q. On the rock itself. Just point out where, in what portion of the north dipping vein that was taken?

A. That was taken in a cross cut marked I 537.

Q. At about where in the cross cut?

A. 30 feet from where this cross cut leaves the 569 raise.

Q. 30 feet northerly of that?

A. Yes; approximately 30 feet.

Q. I hand you a sample of rock which has been introduced in evidence and marked W-4, and which, according to the testimony of Mr. Wiley, was taken from one of these raises. I wish you would place that side by side with the sample of the rock which you took from the cross cut and state to the Court what, if any observable difference there is in those two samples of rock to indicate that they both were not taken from the same vein?

A. Practically there is no difference whatever. Both the varieties being white, and both showing absence of values, and evidences of country rock, that is pieces of country rock frozen on to each. The piece which Mr. Wiley took is a trifle whiter in appearance.

Q. Is what?

A. Is a trifle whiter in color. One is—as I stated, there is practically no difference.

Q. Now, take these raises up, from raise 488 as you travel westerly therefrom, and without further questions, take the raises up in the order which you encounter them as you go to the west and describe each with as much detail as you think is necessary?

222 A. Did you say on the south vein?

Q. No, on the north dipping vein?

A. On the north dipping vein.

Q. Yes, get through with that first.

A. Traveling westerly, the next raise is 461. This follows the hanging wall of the north dipping vein to its top, a distance of approximately 40 feet.

Q. And what is disclosed in it?

A. The vein against this hanging wall is continuously disclosed, with widths varying as in all of the other raises, there being about five feet of quartz near the foot of the raise, and at the top, I should say from memory, a foot and a half or two feet.

Q. That quartz that you find in that raise, as well as in raise 488, state whether or not it is in place?

A. It is in place.

Q. Where it was originally deposited, or whether it has been——

A. In my opinion it is in place.

Q. Go to the next one?

A. The next raise would be the raise 496.

Q. Is that in the north dipping vein?

A. That is in the north dipping vein. That is driven to a connection with the stope above, and is in the vein.

Q. In the north dipping vein?

A. Yes.

Q. Take 2 A passed by that. Two A raise.

A. Yes, I was working out on the level. 2 A raise is extended on the north dipping vein, which is in place, prefectly defined hanging wall throughout, and shows a width varying from five feet

223 maximum to a foot and a half or two feet further up.

Q. Of what?

A. Of north dipping vein.

Q. All quartz, or what?
A. Quartz.
Q. How far has that raise, 2 A, followed up above what is colored, represented in red as the top of the south dipping vein?
A. For approximately a hundred feet.
Q. And what have you at the—does that encounter the cap rock?
A. In one spot only; in the roof.
Q. And what have you in the face or top of that raise?
A. In my judgment, we still have trachyte overlying the vein.
Q. In the roof of it?
A. In the roof.
Q. And what about the floor of the raise at the top?
A. The vein still in the face, smaller than below.
Q. In the floor?
A. Yes.
Q. Now, go to 4 A raise.
A. 4 A raise, as in the case of 2 A raise, follows the north dipping vein continuously to the top of the raise and shows a width of quarts averaging probably 2 feet. In several places it is 4 or 5 feet in width.
Q. And what have you in the top of that?
A. The vein continuing.
Q. Quartz?
A. Yes.
Q. Go to 5 A.
A. Five A is a repetition of 4 A, extended about 70 feet.
224 The only difference being that the vein in 5 A is interrupted at about 70 feet by what appears to be a step fault.
Q. 70 feet above what?
A. The juncture of the two veins.
Q. The juncture of the two veins. And the 6 A?
A. 6 A has only been extended about 23 feet. Shows the north vein followed continuously against a well defined hanging wall; and good widths.
Q. 7 A?
A. 7 A—I guess better start with 494, which is the lower extension really of 7 A. That follows the north dipping vein, does not expose the hanging wall continuously. Has gone pretty well into the foot for certain distances, the hanging wall is exposed by these two raises indicated. The raise then follows the vein up to the juncture with the south vein, and continues beyond that point, as indicated by the yellow coloring, 7 A being, as far as the vein is concerned, weaker than in the other raises.
Q. No quartz in it as you follow it?
A. Yes.
Q. All the way?
A. Not all the way. That is,—not quartz, what I would consider a continuous vein tracing all the way.
Q. How far was that raise driven above the juncture of the two veins?
A. To approximately 40 feet.
Q. And what have you in the top or face?

A. We have a much altered condition of wall rock.
Q. Now, take the next one as you go westerly.
A. The next raise is raise 302.
Q. Point to that please.
A. (Witness does so.) And a continuation of it, 366, although 366 is an older raise.
Q. What is that portion of the 366 raise which is shown in yellow upon this model?
225 A. What is it?
Q. Yes.
A. It is a raise following the north dipping vein.
Q. Above the top of the south dipping vein?
A. Above the top of the south dipping vein until a point is reached about ten feet below the 200 level south cross cut, at which point this vein terminates against the capping.
Q. What have you in that portion of the 366 raise, which you say is in that north dipping vein, in the way of vein material, quartz, or what not?
A. We have a large width of quartz, a well defined hanging wall, which is following continuously to the point stated, against the cap rock, from the connection with the 302 raise.
Q. The next one to the west is the A-raise if I understand you?
A. Well, the A-raise is the next raise of importance, I guess.
Q. Well, describe that. How far is that driven above the juncture of what you call the two veins?
A. About forty-five feet. That raise follows the continuation of the hanging wall carried in this McNamara stope below, and that wall is continuously traceable to the top of the raise,—follows the vein, the raise does, with varying amount of quartz, at a point about five feet back of the face, where there is about two and a half or three feet of vein in place on the hanging wall, low grade ore; showing that different points vary. Down near the foot here it is weaker, at one point.
Q. Than at the top?
A. Than at the point just mentioned yes sir.
Q. A vein back from the top?
A. Yes.
Q. Now is there anything further Mr. Chandler that you
226 have to say, that you think would be necessary to say with respect to these raises on the north dipping vein?
A. Above the juncture with the south dipping vein?
Q. Yes.
A. No, I think not.
Q. Now, take some of the raises here near the easterly end of the claim on the south dipping vein, and describe those, and the juncture as well.
A. Within the limits of the West End claim, or to the east?
Q. Within the limits of the West End claim.
A. The first raise is No. 569, shown there, follows on the south

dipping vein from the top of the stope continuously to the juncture with the north dipping vein.

Q. And at the juncture of the two veins, in that raise what do you observe as to structure of vein?

A. Following up the raise, as I said in the vein, the hanging wall is exposed up to a north dipping wall, against which the south dipping vein terminates.

Q. What is the dip of the south dipping vein, as you follow it up that raise.

A. Oh, looking at the raise, not remembering the dip, I think it is twenty-five or thirty degrees to the south.

Q. And at the top of that raise I understand that you encounter a north dipping vein?

A. We do.

Q. And above that what is the dip of the north dipping vein?

A. The north dipping vein is at about forty five degrees.

Q. Well, go to the next raise?

A. The next raise is 571. and a description of 569 exactly fits 571.

Q. Go on to the next. If there are any features in any one of them, as you come to it call attention to it.

227 A. Raise 573, follows the vein from the top of the stope, exposing a hanging wall most of that distance, and stops against the south dipping wall—north dipping wall as in the other cases mentioned.

Q. Go ahead?

A. Well, those are the important raises that have been previously discussed by the other witnesses.

Q. Taking the south dipping vein how do you classify it? what character of vein is it? Is it a contact vein or fissure vein or bedded vein, or vein of impregnation?

A. I call it a fissure vein. The width of the vein having been increased by a replacement, principally of the foot wall rock by silica; throughout the major portion of the workings, and in other places coinciding with the contact between two rocks.

Q. What is the course generally of that fissure?

A. Easterly and westerly. The strike in the eastern portion of the mine is more nearly east and west, and in the southwest portion the strike is more to the south.

Q. I will ask you if the strike or direction of the south dipping vein is conformable to the strike or direction of the fissure?

A. It is, lying in the fissure.

Q. And how does the dip of that fissure on its downward course, correspond with the dip or downward course of the south dipping vein?

A. It is the same.

Q. The replacement that you have referred to in the foot wall of the south dipping vein, does that predominate, that feature?

A. Almost entirely in the foot wall.

Q. And extends out for varying distances, I take it?

A. It does.

Q. From a minimum to a maximum of what, so far as you
228 have observed?

A. Well, in places in this east territory for at least twenty to twenty five feet into the foot wall.

Q. That is a maximum?

A. For at least that distance.

Q. And the minimum of what in places?

A. Oh, I think never less than five or six feet.

Q. To what extent has the process of replacement or impregnation extended into the hanging wall country of the south dipping vein?

A. Very little, it is negligible I don't off hand recall a place where it extends above the hanging wall of the vein, with the exception—I will qualify that; no, I won't, on second thought.

Q. Coming now to the north dipping vein, how do you classify that vein?

A. That is also a fissure vein.

Q. Is there a fissure there in the north dipping vein as distinguished——

A. It occupies a fissure.

Q. The vein itself—And how does the direction or course of the north dipping vein correspond with the course and direction of this fissure which you refer to?

A. Coincides with it.

Q. What is the dip or downward course of the fissure as compared with the dip or downward course of the north dipping vein?

A. The same.

Q. Conformable? And you have foot wall country of the north dipping vein changed,—impregnated, as in the case of the south dipping vein?

A. We do in places.

Q. And what about the hanging wall country of the north dipping vein; has that been replaced?

229 A. There are a few small vertical fractures in the westerly part of the mine, in which the several minerals has been deposited; cracks merely, and an inch or two in width, practically no silica.

Q. When you come to the plane of juncture of two veins, and for some distance beneath that juncture, I will ask you to what extent the intervening country rock has been replaced mineralized, and sometimes converted into ore?

A. It has been very extensively silicified, so that the entire territory and to the point of juncture, especially under these A-raises, shows a continuous body of quartz in which you may pass from one vein to the other.

Q. The intervening country there being——

A. Quartz.

Q. And vein matter?

A. Yes.

230 Q. I wish, Mr. Chandler, you would describe, as you may think necessary so that the Court may understand it, the re-

lation of that so called Fraction vein to the south dipping vein? You can use the model to illustrate.

A. It has been pointed out a number of times, by the position of the workings in it. Shown here in the West End drift 422 W up to a point here where it is dislocated by a fault to the position here (indicating).

Q. If that is numbered, give it?

A. To 422 N.

Q. How far to the west in this level have you been able—has it been developed?

A. To the point, as shown here, going westerly.

Q. Where the——

A. Where the cap rock is in evidence.

Q. What level is that?

A. That is the 400 level. Drift 422 W.

Q. Go ahead.

A. And it has been followed south easterly in drift 422 north and into 422 south to a point approximately 120 feet from the south side line, where this is crossed by 422.

Q. South side line of the West End claim?

A. Exactly. At which point connection has been made by an upraise from the top of a Jim Butler stope.

Q. Is that a stope in the Fraction vein?

A. It is. And there is a continuous connection in the Fraction vein to 422 S. I say continuous connection,—there is a small step fault between in which——

Q. Between what points?

A. Between the top of stopes and the 422 S. The two seg-
231 ments of the vein having been connected in this fault in drag ore.

Q. Go ahead.

A. There are other minor stopes in this Fraction vein in this immediate territory. It is not necessary, I guess, to go out in this——

Q. Go down to the point where the two, the Fraction and the South dipping vein unite, if they do unite?

A. Well, going down the winze—the winze in the main West End south vein, extended on down to here (indicating) an upraise was made cutting the Fraction vein, which was followed to a connection with the 7th Butler level in the same vein. This stope 718 in the Fraction vein above the 7th level is practically connected with the main West End vein by a raise on the vein, now being extended to close this gap.

Q. Now, in the Jim Butler workings, is there a connection between the Fraction vein and the south dipping vein?

A. There is, just east of the West End winze, mentioned, and shown by this working.

Q. What working, so the record will show?

A. From W 700 to West Drift 702, a connection has geen made.

Q. The two unite there, the Fraction vein and the south dipping vein?

A. Yes. This is in Fraction vein down to its juncture with W 700.

Q. I call your attention to what has been referred to in cross-examination of one of the witness- as a stope there in the shape of a roll or an anticlinal fold.

A. Yes.

Q. What have you to say about that, if anything?

232 A. Apparently it shows a fold, or what you term a roll. It is a very small proposition, however, and is probably accounted for by the fact that the stope is faulted and the appearance is given largely on account of stoping in both segments, as well as in the drag between.

Q. Is that stope on a contact between different rocks, or does it lie all in homogeneous rock—trachyte?

A. Both foot wall and hanging wall is trachyte?

Q. This south dipping vein and the north dipping vein, either or both of them have any place which might be termed a contact vein?

A. Only in the sense that the fissure coincides, as explained previously, with a contact for a certain distance, throughout both properties.

Q. I wish you would pull down Exhibit G. I call your attention, Mr. Chandler, to Section A of Exhibit G; of course, what is colored in red there, the longest streak of red is intended to show the south dipping vein?

A. Yes.

Q. And the upper, the Fraction vein; and the yellow the north dipping vein.

A. Yes.

Q. What is the foot wall country rock of the north dipping vein and the south dipping vein at that plane of Section—you know where that was taken?

A. Yes. I call it trachyte.

Q. What is the north, or hanging wall country rock of the two veins?

A. The same rock.

Q. Here I notice on Section A a small space colored brown. What rock is that?

A. That is intended to represent a small distance here
233 where the West End rhyolite is shown, or what be believe to be West End rhyolite.

Q. Is that in contact with the south dipping vein, or slightly below it?

A. It is immediately in the foot wall.

Q. Elsewhere, is it true that the footwall country and hanging wall country are trachyte as cut by that vein section?

A. In this section?

Q. Yes?

A. Yes.

Q. Going to Section B of the same exhibit. The veins are there again disclosed, the Fraction vein, south dipping vein, north dipping vein. I will ask you what the footwall country and hanging wall country is where that plane of the section was taken?

A. Trachyte, except at the point shown at the top of the Fraction

vein against the cap rock. The enclosing rocks however, are trachyte.

Q. Go to section C, where you have the same veins depicted. What is the footwall country of the north dipping and south dipping vein where that plane of section was passed through or taken?

A. As explained a few minutes ago, the vein, in certain limited area, coincides with the contact between two rocks which we call trachyte and West End rhyolite. This section illustrates that, the footwall country being what we term West End rhyolite and the hanging wall rock trachyte.

Q. Is it your judgment that the north dipping and south dipping fissures, which you have referred to, formerly in your testi-
234 mony, follow the line of contact between the line of rhyolite and trachyte?

A. That is my opinion.

Q. Going to section D on this same exhibit, what is the foot and hanging wall country which encloses both the north dipping and the south dipping veins?

A. That is a section to the west of this section, and shows again the enclosing rock to be trachyte.

Q. I will ask you to point out to the Court, or indicate the place, if there be any such, where you find at the juncture of the north dipping and the south dipping vein a gradual change in the dip of either one of them, as they approach and meet, or whether the fact is, where you have been able to observe the point or the line of plane of juncture, there is an abrupt change from a south dip to a north dip?

A. The change from a south dip to a north dip is a sudden one The angle between the south dipping hanging wall and the north dipping hanging wall being in places as small as 20 or 25 degrees. In other words, it is a sharp, sudden change in dip.

Q. Between the two veins. Does the hanging wall proper at the uppermost limit of the south dipping vein come in contact with the hanging wall of the north dipping vein?

A. Never in actual contact with the hanging wall. They are very close in several places.

235 Q. You have never seen the hanging walls of the two veins in actual contact?

A. Never seen the hanging walls of the two veins in actual contact?

Q. Yes, the hanging wall of the south dipping vein in contact with the hanging wall of the north dipping vein?

A. I can be certain throughout all the territory, with the exception of A raise, and the stope from the McNamara to the West End, and the condition is indeterminate to me at that point. I can not say that the hanging wall of the south dipping vein does not actually reach the hanging wall of the north dipping vein.

Q. You mean that place that is undeveloped. That has been referred to in 703 raise?

A. No I mean in raise—A; the hanging wall of the south dipping vein is not visible just below the A-raise, because there is still vein or quartz in the top of this stope.

Q. The top of the red stope?

A. Unless that wall were continuously stripped up through here I would not want to make a statement as to that.

Q. Well, apart from that?

A. Well, apart from that throughout this eastern country in all these raises, over to 302, the hanging wall of the south vein does not reach the hanging wall of the north vein. In one of the A-raises I have noticed the hanging wall of the south vein within two feet of the hanging wall of the north vein in one place,—4-A raise.

Q. Were you formerly Mr. Chandler, of the opinion,—a different opinion respecting this vein than you now entertain?

A. Which vein?

Q. Were you formerly some years ago, did you have a different opinion from that which you now entertain respecting this
236 vein in the West End ground, this main vein or veins?

A. You are speaking now of the north vein?

Q. The two veins.

A. Yes, sir.

Q. You remember a suit that was at one time pending between the West End Mining Company and the McNamara company?

A. I do.

Q. And that case did not come to trial as I understand it?

A. No.

Q. And were you connected or employed by the McNamara in connection with that litigation?

A. I was.

Q. For how long a time Qending that litigation?

A. Throughout its whole extent. I don't remember how long it was pending I guess a year or more.

Q. I wish you would describe to the court so far as your memory and reference to the maps will aid your memory, and enable you to do so, the extent of the work, the development work in the West End ground on this vein, on the 200 level of the West End; you may refer to the map if you wish.

Mr. Lindley: As to what his former opinion was?

Mr. Dickson: The extent of the development work at thw time that he had the former opinion.

Mr. Lindley: Is This intended as an apology or an explanation?

Mr. Dickson: As an explanation.

Mr. Lindley: Well if you don't bring that out I will do so.

Mr. Dickson: I supposed so. It won't take any more time now than then.

Q. Referring to the map——

A. I can point it out here. This is largely a matter of
237 memory.

Mr. Lindley: I may be able to help out your memory Mr. Chandler.

The Witness: I will be glad if you can judge.

Mr. Peck: I suggest that Judge Lindley take the stand and give his testimony now.

Mr. Dickson: Go ahead, how far has the workings developed, what you now speak of as the north dipping vein.

A. On the 200 level of the McNamara this west drift had been run.

Q. In what west drift?

A. This west drift.

Q. That is cap rock?

A. Well, it had been run——

Q. Well go ahead in your own way.

A. Out to the vein here.

Q. Well the record will not inform any of us as to what "here" is. You will have to designate it.

A. There is no number on the stope so I cannot refer to that.

Mr. Lindley: I would like very much Judge Dickson to have that drift numbered.

A. It is the 200 west drift of the McNamara, Judge.

Mr. Lindley: I am familiar with the drift but the testimony won't show it unless it is numbered. Just number that Chandler-1 to identify it.

Mr. Dickson:

Q. And you had better indicate at the same time points that you wish to refer to in answer to this question.

A. Well, as nearly as I can recollect the two hundred west drift of the McNamara had been constructed up to that time to a point marked in pencil "C-X."

Q. On the model?

A. On the model. Understand this is from memory, but I
238 think it will be approximately correct. Stoping had been under way in this stope above the 200 west drift, the only stope shown here on the model.

Q. Is this—In which the raise—A is now found?

A. At the top of which raise—A is now located, and had joined the stope of the West End company, directly south.

Q. And shown on this model in red?

A. In red.

Mr. Lindley: Any upraises, if you will pardon the suggestion?

A. This upraise (indicating).

Q. Better number that too then.

Mr. Dickson:

Q. What did you number that here.

A. I just numbered that C-X. What do you want it numbered?

Q. Well, (C-1) will do.

A. Suppose I number it "R-3"; that is what we called at that time apex raise No. 3.

Q. Anything that will designate it.

A. Raise "R-3" had been run to its present face.

Q. Go ahead.

A. The upraise,—that is not numbered either directly below and slightly to the north of upraise No. 150 had been put up.

Q. From what level?
A. From the 200 level south cross cut.
Q. Go ahead——
A. There are several raises here probably too, but to the best of my recollection the workings had not extended at the time as far west.
Q. You mean this far west?
A. As far as these other raises.
239 Q. According to your best recollection about where was the most westerly development on the vein.
A. I have marked it here and referred to it as "C-X." I don't recall any raise above the 200 that had been put up at that time, from the 200 McNamara.
Q. How far easterly on the 200 level, had the vein been developed at that time?
A. Easterly on the 200 level of the McNamara?
Q. Yes. I will speak now of what we call the north vein. How far east had that been developed?
A. The most easterly point that the vein had been exposed by any workings on the 200 level in the McNamara was at the point where the south cross cut to raise 150 was started.
Q. How far westerly, according to your best recollection, had the vein been disclosed at that time, the south dipping vein?
A. Almost as far as the 200 level west on the West End company, as it now shows. West to what point I cannot say.
Q. But nearly as far as shown now?
A. Yes, within anyway one hundred feet.
Q. How far easterly had the south dipping vein at that time been disclosed, on that level the 200 level of the west end?
A. To the best of my recollection the most easterly point that the south dipping vein had been found on the 200 level of the West End, was at the foot of upraise 202, but of that I am not certain.
240 Q. You are not certain that it extended that far, are you?
A. I mean I don't know whether this 202 drift had been extended as far westerly as that. I believe it had. That is a long time ago.

Mr. Lindley:

(Q.) Where is that, Mr. Chandler?
A. Right here, Judge Lindley (indicating). That is a long time ago and I can't be certain of that.

Mr. Dickson:

(Q.) Now, I do not know, it seems to me we might go into the 300 level. It would be preferable to use the map instead of the model.
A. They are all numbered on the south side.
Q. State, according to your best recollection, how far easterly and westerly—that is, how far to the east and to the west had the north dipping vein at that time of the MacNamara West End litigation pending been developed on the 300 level?

A. How far east or west?
Q. Yes?
A. Which?
Q. Both; the westerly and easterly termini of the works on that level at that time, 300 level?
A. I don't believe West End drift 302 W had been run at that time, and I believe the farthest point to the west to which the north vein had been discovered was near the MacNamara line, directly north of the West End shaft.
Q. And about what point would that be on the model?
A. In raise, or in cross cut—what is that number? 110, is it?
Q. Looks to me like 116. I don't want any mistake about it. What is the number?
241 A. I do not mean raise. That is not a raise. In cross cut 311.
Q. And how far had the vein been disclosed at that time, the north dipping vein easterly on the 300 level, the farthest point east?
A. I think in the 303 East drift.
Q. At about what point on the model, if it is shown on the model?
A. At the raise——
Q. Westerly, I am speaking of?
A. I gave you westerly first.

The Court:

(Q.) You said easterly.
A. Well, that will have to read westerly.

Mr. Dickson:

(Q.) So that we will get it right, if I understand, then, the most westerly workings on the vein or in the vein on the 300 level at that time was in that cross cut 311?
A. Cross cut 311. And the most easterly point, to the best of my recollection is or was in 316 cross cut from 303 east drift, at a point at the foot of raise 362.
Q. Then, about to what extent, according to your recollection, easterly and westerly, had the vein been disclosed by any workings at that time?
A. I did not get that.

(The reporter read the question.)
The Court: Referring to the 300 level?

Mr. Dickson:

(Q.) The 300 level, yes.
A. Oh, approximately 150 feet.
Q. Now, going to the 400 level. Oh, no, before I go to that: to what extent at that time had—strike that out. At that time,
242 what were the most easterly workings on the south dipping vein, according to your best recollection on the 300 level?
A. On what level.
Q. The 300 level?

A. I believed that there was only one vein at that time, so that the answer in regard to the——

Q. You believed there was only one vein at that time?

A. My answer in regard to the extent developed on the north vein would apply in answering this question.

Q. Would be true also to the south dipping vein. What we now call the south dipping vein?

A. Yes.

Q. Then, we will go to the 400 level, and give us your best recollection as to where development work on the vein on the 400 level—vein or veins—terminated in a westerly direction?

A. Once more, please?

(The reporter read the question.)

A. In what property?

Q. In the West End claim. The most westerly development on this vein or these veins on the 400 level at that time, either in the West End workings, or the MacNamara workings?

A. I believe that the most westerly workings from the 400 were at that time in 403 stope.

Mr. Lindley:

(Q.) You have reference now, Mr. Chandler, to the south dipping vein?

Mr. Dickson: He is pointing now.

Mr. Lindley: I understood your question to apply to either the MacNamara or West End.

Mr. Dickson: Yes, he is pointing now first to the south
243 dipping vein. Then I will have him go to the north dipping vein.

Mr. Lindley: The most westerly development?

A. Most westerly development on the 400 level on the West End property. I believe that the operations farthest to the east at that time——

Mr. Dickson:

(Q.) To the west.

A. To the west were in 403 stope, just west of the present working shaft.

Mr. Lindley:

(Q.) The most westerly workings of the West End at the time of the litigation between the West End and the MacNamara was where?

A. On the 400 level. I believe was in stope 403.

Q. Oh, on the 400 level?

A. Yes.

Mr. Lindley: I beg your pardon.

Mr. Dickson:

(Q.) And where at that time on the 400 level was the most easterly workings that had been driven on the vein disclosing it?

A. Most easterly workings?
Q. Yes?
A. Now, this is going back into ancient history, but—at a point at the foot of upraise 485 about 40 feet south east of the old McQuillan shaft.
Q. Now, at that time on the 400 leve-, where were the most westerly workings of the MacNamara?
A. 400 level?
Q. 400 level.
A. They have no 400. The next level below the 3 is the 375.
Q. Well, go to the 375, then. Had that been driven at the time of that old litigation?
A. There are no workings in the vein on the 375 level—were no workings in the vein on the 375 level at that time.
244 Q. What was the deepest level in the mine—the workings in the deepest level, workings of either the West End Company or the MacNamara at that time?
A. What were the deepest workings?
Q. Deepest level, yes.
A. The deepest level of the MacNamara was the 500 foot level; and the deepest level of the West End, I believe, was the 400.
Q. Well, to what extent easterly and westerly had the vein which we now call the north dipping vein been developed on the 500 foot level?
A. Of the MacNamara?
Q. Yes.
A. Not at all.
Q. You say that at that time, the time of that litigation, you believe that there was but one vein?
A. I did.
Q. You have pointed out the place on the 300 level, I believe it was, where the works in an easterly direction at that time—the workings on the vein on the 300 level terminated easterly?
A. In what property?
Q. Well, we will say in the West End Company's workings?
A. 300 level easterly; yes, I did.
Q. You did not intend that to represent the most easterly workings on that level in the MacNamara?
A. No, that was in the West End ground?
Q. Where were the most easterly workings in the 300 level in the MacNamara ground at that time?
A. In the 300——
Q. On the 300 level, yes.
A. Yes, in the 300 east drift.
Q. How is it designated on the model, if at all?
245 A. Well, it is the east face of the 300 east drift at a point——
Q. Well, that 300 east drift ought to be marked.
A. It is marked 300 here. It runs west of the shaft, and it is east

of the shaft, and the point I refer to is a point in the face of the east drift.

Q. What were the most westerly workings in the MacNamara on the 300 level at that time?

A. Not shown on this model, because, they extend north.

Q. Get the map. Will they be shown on the map?

A. I think so. It would be pretty hard to refer to this point. I know where it is, but there are no numbers for reference here; no stations.

Q. Well you are referring to the map of the fourth level, labeled Exhibit C?

A. The fourth level of the West End,—no the 300 level of the West End.

Q. Well, distinguish on that exhibit by drawing a line and putting your name over it, or the word, Chandler, over it which will show the most westerly workings of the McNamara on the 300 level at that time?

A. You mean now at the time that this suit was instituted?

Q. At the time that suit was pending, from the beginning or until the time that it was settled.

A. Well, work was *was* going on during that entire period.

Q. Well where was it at the time that that suit was commenced?

A. That is what I have been referring to, the time the suit was instituted. I have marked the point in the main McNamara 300 level. I have marked it with the mark 'C-X' with my name
246 over it and the mark is in the 300 main drift of the McNamara.

Q. You have made that marking on Exhibit C?

A. I have. That is as near as I can recollect.

Q. You say that you have been answering all of the time, as to the extent to which the workings had extended easterly or westerly at the time that suit was instituted?

A. As near as I can recollect.

Q. What I had in mind, was the most easterly and westerly workings of the vein, while that suit was pending, I will not take the time to go over it again. Mr. Lindley can bring that out on cross examination if he desires.

I will ask you if at the time that suit was terminated, was settled, you were still of the opinion, in the light of the then development, there was then but one vein?

A. I was.

Q. At that time, and I mean now not when the suit was commenced, but when it was finally settled, had there been any raises put up above the crest, of what you took to be the only vein? If so how many and where?

A. Upraise No. 488 had been extended a short distance above the 411 East drift.

Q. Any others?

A. Upraise 4-A had been extended above the juncture of these two veins.

Mr. Lindley: What time is he speaking of?
Mr. Dickson: The time that the suit was settled.

A. Upraise 4-A had been extended practically 25 ft. above the juncture of the two veins.
Q. Any others?
A. Your question as I recall, referred to raises above the juncture of the two veins.
Q. Above the juncture of the two veins?
A. So as it was not demonstrated at that time that 488 was above the juncture of the two veins, that raise would not ap-
247 ply.

Mr. Lindley:

Q. Well that raise was run?
A. Yes, it was run.

Mr. Lindley: All we want is the facts.

Mr. Dickson:

Q. Had the fact of the junction between the two veins at the point where the raise 488 was run up been uncovered?
A. The juncture of the two veins?
Q. Yes?
A. No it had not.
Q. How about the point at 4-A had the juncture there been developed at that time?

Mr. Lindley:

Q. It is in that group of raises?
A. 4-A is here, yes.

(Last preceeding question by Mr. Dickson read.)

A. Yes.
Q. Without showing what it was, I suppose that there were other general experts engaged with you in the examination on behalf of the McNamara company at that time; you were not the only one?

Mr. Lindley: He was not the only one, who was not the only one?
Mr. Dickson: This witness.

Mr. Lindley: Mr. Chandler was not engaged as *as* expert at that time, he was manager of the company.
Mr. Dickson: Well, I did not know that, I thought that he was an expert from what I have seen of the record.
A. No, not at that time.
Mr. Lindley: He developed into that later.
The Witness: Later.

Mr. Dickson:

Q. Were there experts employed at that time by the Mc-
248 Namara company?
A. There were.

Q. Was this raise 4-A—don't say what was said,—was this 4-A a matter under discussion between you and any of the experts?

Mr. Lindley: I object to that as being entirely immaterial, if the experts are here in the court room.

Mr. Dickson: I just asked as a matter of discussion. I did not ask what was said.

Mr. Lindley: Put me on the stand — swear to it.

Mr. Dickson: Well do you object to it. I did not ask what was said.

Mr. Lindley: Well, if the court will permit me just a moment to make a parenthetical remark at this stage of the game; this gentlemen has been put upon the stand to prove the condition of two veins, and to apologize or explain why he thought at one time there was only one vein. Now that is all the advantage I think counsel is entitled to. How he might have been mislead by experts is a matter that is entirely immaterial, and if he had that conviction at that time, he was the superintendent in charge of the McNamara company. Counsel is entitled to that but what his discussions were with his associates——

Mr. Dickson: I did not call for the discussion, and I will withdraw the question if there is any objection to it. I simply desired to show that it was discussed, significance of that raise without saying what was said about it.

Q. You may state what your opinion was while that suit was pending, from the time it was brought until it was compromised as to whether or no an anticlinal fold or roll could or could not be
249 regarded as the top of the vein.

A. I was given to understand that the crest, of a roll or fold was not a legal apex.

Q. It was not a legal top of the vein?

A. The legal apex.

Q. Now do not answer this question; I do not know whether counsel will desire to object to it or not. You say that you were given to so understand. I will ask you if you were so informed by counsel, leading counsel for the McNamara company.

Mr. Lindley: I have no objection. Certainly he knows as everybody knows that that has always been my position and I have not changed it either.

A. Yes, I was.

Mr. Dickson:

Q. Now I wish you would state Mr. Chandler—take your time—enough to cover all that need be said or that you can say on the subject—all of the facts observable by you, and which has been observed by you since that litigation between the McNamara and West End Companies has induced you to change your opinion which you then entertained, and to reach the conclusion which you have here testified to, namely, that we have two veins, namely the north dipping vein and the south dipping vein.

Mr. Lindley: I object to that as being purely self serving. He stated the facts and that is all that this court desires to know, and the reasons are material only in the mind of the witness. He has stated his position, stating that he has changed his mind, he has gone over the structural conditions here, and explained why
250 there are two veins, and in my mind that is merely an opportunity for the witness to bolster up his own testimony.

Mr. Dickson: I do not think that you mean to use that phrase "bolster up his own testimony" in an offensive way.

Mr. Lindley: No I never do. Mr. Chandler and I have been friends for years, but I have my views the same as Mr. Chandler has.

Mr. Dickson: Yes. Most gentlemen and most experts I suppose would not hesitate or fear to state that they had been induced, or he had been induced, to change his opinion respecting any vein, and that change of opinion was induced by the light shed upon the situation by subsequent development work.

Mr. Lindley: Isn't that obvious from his own statement?

Mr. Dickson: I think that I am entitled to it. I will take a ruling.

Mr. Lindley: Well I will withdraw the objection.

251 A. That does not include an explanation of the basis of my belief, that at that time there was but one vein, as I understand the question?

Q. Yes, it does.

A. As stated, I was superintendent of the MacNamara mine at that time, among other places, where we were working, we were engaged in stopeing in this stope from which A raise is made.

Mr. Lindley:

(Q.) A raise had not been made at that time?

A. It had not. We followed the vein upward on its dip in this stope to a point which at that time appeared to be the crest of the fold or roll, and from which point the stope, the commercial ore took a dip to the south into the property of the West End Mining Company.

Mr. Dickson:

(Q.) The crest, or what you then took to be the roll at that place is over the north side line of the West End, within the MacNamara ground?

A. Yes, sir.

Q. Go ahead.

A. So, as a matter of fact, we mined over the change in dip to the line of the West End Company; at which point this vein continued to dip southerly and into their ground.

Q. Go ahead.

A. On that development alone, I came to the conclusion that it was one vein, having formed a fold or an anticlinal roll.

Q. Where else at that time—withdraw that. I do not want to interrupt the witness. Go ahead, Mr. Chandler.

A. The only other place, as I stated before, that we had any development around the top of what we now term the north
252 dipping vein, was raise 4 A, where we found that there was what we called a break or a fault. And that the north dipping vein, with a well defined hanging wall, extended upward and above what we then considered the south leg.

Q. South leg of what?

A. This fold or anticline.

Mr. Lindley:

(Q.) Single vein?

A. On the single vein theory. I personally did not pay any attention to that condition here because our territory over here opposite is a very small wedge, and we had—the territory is very small, this wedge here, and we did not believe it was very valuable, our developments, ore developments were considerably further to the West. So, as I say, I did not give that much consideration.

Mr. Dickson:

(Q.) At that time?

A. At that time. We wanted to protect ourselves on account of the ore extracted and in the process of being stoped, and wanted to continue our developments in this territory where we had found ore in a number of places.

Q. Go ahead, if you have anything else you wish to add.

A. I don't know just how much in detail I ought to go into this change of attitude on my part, but if it is permissible, I will say I had been engaged by the West End Company for some months previous to the institution of this present suit in an advisory capacity in respect to the West End Mine, and also—I believe I stated this before—was to be called upon to make any outside examination. When this suit was brought——

Q. You mean the present suit?

253 A. Yes. I was called into conference, and when asked regarding the situation from my previous experience in the——

Q. Well, now, you need not state what you said outside of the court room to anybody. That would be hearsay.

A. I see. Well, then, the recent development——

Mr. Lindley: What the witness said?

Mr. Dickson: What he said to somebody on our side of the case.

Mr. Lindley: You claim the communication was a privileged one?

Mr. Dickson: No, I thought you would object.

Mr. Lindley: No, I do not.

Mr. Dickson:

(Q.) Just state, then, what you were about to say.

A. I was called in conference and asked regarding the previous litigation and my views. I said they had not changed any. If there is any other condition than the one I believed to be the case, that it would certainly take considerable work to ascertain the facts. And

I suggested certain work to develope the facts through this eastern portion of the territory.

Q. And what development do you refer to now? What development work?

A. Theses raises, 569, 571, 573, the A raises.

Q. All of the raises that have been put up since the commencement of this suit?

A. Yes.

Q. Including the A raise?

A. Including the A raise. And as a result of those developments, I have been forced to change my mind.

254 Q. At that time, was there anything at any place in the vein or veins that you believed to be what you call the toe of the roll? And if so, I will ask you to point that out and explain what you mean by it?

A. There was. What we termed then the two legs of what we believed to be a fold were converging in strike to the east, and if there actually was an anticline, anticline or a fold, of necessity at some points in this eastern territory we would be able, and have to, as a matter of fact, to establish it, come around on a curved line.

Q. At the easterly end?

A. Yes, come around on a curved line on the 400 level from the north east dip, on what we now call the north vein to the southerly dip on what we now term to be the south vein.

Q. Well, did you come to any such toe or curve at that time, or was there any such disclosed? Or what you took to be such?

A. There were indications of a toe.

Q. Where?

A. In the neighborhood of the old McQuillan shaft, or just east of there.

Q. Well, about what——

A. Well, around No. 461, number 485.

Q. In that neighborhood?

A. Yes. There were indications of a toe, although there had been no developments on either the south hanging wall or the north hanging wall, so that until developments were instituted and those walls followed——

Q. Further east?

A. Further east, there could be no certainty. Those developments have been made and show that instead of there being
255 a coming around on the toe of a roll, that each vein, as we now term them, continued on the average strike line, as shown for some hundreds of feet, and did not coincide so as to form one common hanging wall.

Q. Or curve?

A. Or curve.

Q. Continued on to the east. Where at that time—I mean now up to the final determination of the old MacNamara suit, at how many places had the crest, of what you then took to be a roll or the juncture or what you now claim to be the juncture of the two veins been disclosed by any workings?

A. Only in 4 A raise, and the stope from which A raise in the MacNamara has been put up.

Mr. Dickson: I think that is all the direct.

The Witness: Judge Averill, is it permissible to speak to our attorney at this time?

The Court: Any objection to Mr. Chandler speaking to his counsel?

Mr. Lindley: Not the slightest, no sir.

The Witness: I would like to speak to Judge Dickson privately a moment.

(Witness does so.)

Mr. Dickson:

(Q.) Then, do I correctly understand, Mr. Chandler, that at the time that litigation was pending and up to the time it was settled, the only places, being two, were the crest of what you then believed to be a roll in one vein—that at both those places, the appearance was of a gradual, unbroken fold from a north dip to a south dip?

A. No. The only place—there were two places, yes. The only place that that development seemed to certainly point to
256 that condition——

Q. That is, a roll?

A. Yes. Was in the stope in this region of the A raise. I said that the indications east of the old McQuillan shaft in the region or neighborhood of 461, 485 etc. pointed to there being the toe of a roll.

Q. Yes, the end of it?

A. Yes. But that this was not determined, and could not be, as I stated before, until drifts h-d been run easterly on both the hanging walls of what we now term to be the north and the south veins.

Q. Yes; I do not think you quite understood my question. The question was this: I understand that at that time, while that suit was pending, there were only two places where the top or crest of what you then regarded as a roll in the vein had been disclosed, namely, where the A raise now is, and at the bottom of the 4 A raise?

A. Yes, except that at 4 A raise there was no indication of a roll.

Q. There was no indication of a roll there?

A. As I stated before, we considered that there was a break or a fault.

Mr. Dickson: The witness called me aside to say that he wished to make a correction in one of his statements. You may make the correction now.

The Witness: You asked me about the sudden change from north to south dip. I said it was sudden, and I mentioned an angle, and that was merely a guess, and should not go in as testimony.

Q. Well, what angle did you give, do you remember?
257 A. I gave 45, didn't I?

Q. 25, I think.
A. I would like that sentence stricken out of my testimony.
Q. What would be the angle? What do you want to substitute?
A. It is a greater angle than that.
Q. What is it?
A. I have not measured it.

Mr. Dickson: Well, do that at noon. There are one or two questions more in direct.

The Court: The case is continued until 2:0- o'clock this afternoon.

258 Afternoon Session, 2 o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

JOHN W. CHANDLER, direct examination, resumed.

Mr. Dickson:

(Q.) Mr. Chandler, have you ascertained the included angle between the hanging wall of the north dipping vein and the hanging wall of the south dipping vein?
A. Yes, the average.
Q. What is it?
A. In the neighborhood of 125 degrees.
Q. Instead of 25?
A. Yes; just add 100.
Q. These veins, I mean the south dipping vein as well as the north dipping vein, on their course westerly terminate against what; what, if anything, interrupts the onward course of the veins as you go to the west?
A. There is nothing so far that interrupts the course of the north vein to the west.
Q. What about the south vein?
A. The westerly workings of the south vein and against Mount Brougher dacite.
Q. And eruptive rock, is it?
A. Yes sir.
Q. An extensive intrusion?
A. From the data we have at present, I would say so, yes.
Q. You say it does not terminate the north dipping vein?
A. Not on its strike; it does on its dip.
259 Q. Do you find the north dipping vein on its strike westerly, on what is shown on this model?
A. We do.
Q. Where, in what claim or claims?
A. In the California Claim, of the West End Mining Company.
Q. How far westerly of what is shown on this model is it disclosed, if you know?
A. Well, possibly no further west. It is interrupted here by a fault and offset to the north.

Q. Well, where dod you find it in the California?
A. Where this stope is in the vein.
Q. Now, turning to a stope shown on the model, the most westerly, in yellow?
A. Yes.
Q. Now where do you find it in the California further West?
A. Where the stope is in the California ground.
Q. Is now?
A. Yes.
Q. And has it been developed westerly of what is shown on this model?
A. Yes, but in a different position.
Q. Where?
A. North of this stope. If you notice the yellow here is terminated against what indicated a fault.
Q. Yes. A fault.
A. Yes. That color does not appear to be a fault,——
Q. Well this color is purple?
A. I mean this line.
Q. Oh, yes, I see. Where beyond that point westerly do you find this north dipping vein?
A. We find it at the same depth only, but offset to the north.
Q. And how far to the north about?
260 A. Oh, it won't show on any of the maps.
Q. Well approximately?
A. Well one hundred feet approximately.
Q. Well how is it developed there by what cross cut or winze or shaft?
A. By a cross cut in trachyte and in about this position. (Indicating.) By a cross cut west of the present stope to the north in trachyte and by an upraise from this cross cut.
Q. It is encountered in the upraise from the cross cut?
A. Yes.
Q. Has the work been *drived* westerly on that at all?
A. Not so far.
Q. Is that a recent discovery?
A. Yes, quite recent.
Q. Where, you have it in the upraise in the California, is it connected with the stope shown upon this model?
A. The two segments of the vein have not been connected in the fault up to the present time.
Q. In your opinion is the vein discovered in the upraise which you have referred to in the California ground, a part and portion of the same vein shown in yellow on this model?
A. No question in my mind but that it is.
Q. Is that portion of the vein which is disclosed in the upraise which you have referred to,—has the vein there been followed up to the cap rock?
A. No; it is being followed in that direction.
Q. You spoke of raise 4, I think, as being the raise that had

been made before, as driven up some distance before the settlement of the old McNamara litigation, is that correct?

A. No I should have said 5-A; I referred to it throughout as 4A and it should have been designated 5-A.

261 Q. You spoke of having been called in conference with some of the West End people shortly after this suit now on trial was commenced, at which time you stated that your opinion was the same as it had theretofore been. Did you at that time refer to that 5-A raise?

A. I did.

Q. Up to that time, I understand you to say that you regarded that as probably a local condition, that vein here on up into that raise?

A. Yes, and at that time.

Q. At the time of the conference you still so regarded it?

A. I did.

Q. Did the fact of that raise, the 5-A raise, being driven up and the north dipping vein above the line of juncture between the north dipping and south dipping veins, have anything to do in leading you to directing the making of other and additional raises, in order to ascertain whether what was revealed in the 5-A raise, was a local or general condition?

A. Yes, it did.

Q. Was it at your suggestion that this was—or your advice, that these additional raises were put, that have been put up?

A. It was a suggestion of mine,—not entirely mine; that is, it was advised by others.

Q. Did you after that conference find that you had any difficulty in finding the old 5-A raise?

A. Yes, it took some time to find its old location. There had been waste filled in around there, and it was difficult to locate the raise.

262 Q. You remember which raise in order was next put up after you decided to make further raises to decide what the facts were.

A. There were several started. If I remember correctly both 5-A and 2-A. I would not be sure of those numbers in the order that they were made.

Q. Leaving these raises now, I call your attention to that portion of the model that lies immediately east of the main frame, in which the main part of the model is included, shown here in yellow, and going up from a yellow drift or level. Have you been up that?

A. I have not.

Q. You have not been up there?

A. No.

Q. At the time the McNamara suit was pending, before its settlement, do you know whether a model was prepared by or for or on behalf of the McNamara company?

A. There was.

Q. What kind of a model was that wood, or glass or what?

A. Wood, a solid model.

Q. Did you prepare it?
A. You mean actually con-truct it?
Q. Yes.
A. No, I did not.
Q. Did you have anything to do with the construction of it?
A. Not in the actual labor.
Q. Now, any suggestions about how it should be constructed?
A. Yes, at different times in connection with others.
Q. And did you see it after it was completed?
A. Yes, sir.
Q. I will ask you whether or no—I will change that question so that it won't be leading—on that model what was represented as the easterly termination or end of what was then supposed to
263 be the one vein?

Mr. Lindley: The model is the best evidence.
Mr. Dickson: Well, I understand it is in California. I don't know.
Mr. Lindley: That is not our fault.
Mr. Dickson: No, and it is not our fault. It is out of the jurisdiction of the Court, and I understand the rule of evidence to be that where a document, even, is beyond the jurisdiction of the Court, a witness who has examined it and knows its contents can testify to the contents of the document. And I am very well satisfied that I find authority upon that, if it is controverted.
Mr. Lindley: It is not worth while.
Mr. Dickson: All right. Read the question.
(The reporter read the question.)

Q. How was it shown on the model, that eastern termination?
A. As a fold or a roll, more properly speaking.
Q. A fold or a roll, in what direction? I am speaking of the eastern end of the——
A. The termination easterly did you say?
Q. Yes?

The Court:

(Q.) That is westerly over there, Mr. Chandler.
A. Yes, I know it is, Judge. It was shown as an anticline—anticlinal fold, with what we termed a toe here at the old McQuillan shaft.
Q. The old McQuillan shaft?
A. Yes, just east of the old McQuillan shaft.
Q. You are speaking of one place and pointing to another is why I asked you.
A. Yes, I beg your pardon.
264 Q. Just describe how that toe, as called, was shown upon the model? How was it represented on a level?
A. The model could be taken apart down to the plane of the vein, which surface was painted red, and with numerous faults shown, the fault plane being painted, I believe, blue, and as that model was—as construction was carried easterly down into this ter-

ritory immediately east of the old McQuillan shaft, the surface of the vein, the one vein, as we supposed then, was shown in the shape of the toe of a roll. In other words, you could come around from the south dipping side on a curved line to the north east, and more northerly dipping——

Q. On one and the same level?

A. On one and the same level.

Q. And was it your opinion at that time that that was the termination of that vein in its course easterly?

A. I believed that the evidence justified the assumption of the toe of a roll. And that would not mean, necessarily, the termination of the vein on the 400 level, as it was still dipping easterly.

Q. Now, has the subsequent developments shown that you had no toe there, and if so, how have they shown that?

A. They have shown that very clearly by the east drifting on the south dipping hanging wall, and the south east drifting on the north dipping wall continuously, and has shown that instead of one wall coming around into the coincidence with the other and forming a common hanging wall, that they maintained their average strikes, and drifting upon the south dipping hanging wall, in connection with the stopes and raises has shown it to be continuous, not
265 only to the east end line of the West End claim, with an approximate east and west strike and south dip, but continuing also into the adjoining stope of the Tonopah Mining Company directly to the east.

Q. Do you remember whether on that model the 5 A raise was shown?

A. I think not, Judge Dickson. I am not absolutely certain, but I think it was not shown.

Q. Of course, there were no raises—if that was not shown there were no raises shown on that model that had been projected up in the han-ing wall of what you now call the north dipping vein above the top of the south dipping vein?

A. No.

Q. Can you, Mr. Chandler, give us a little sketch on paper or the blackboard—on paper would be preferable, the appearance of that toe as shown on the model on that 400 level?

A. It is a pretty hard thing to show. It would be in at least 3 dimensions.

Q. I do not mean to be at the same scale that the model was?

A. I can show you what a section would look like through that toe or a plan. A plan would probably illustrate more clearly.

Mr. Peck: You had better take a piece of paper, Mr. Chandler.

Mr. Dickson: I have not offered any testimony, Mr. Lindley, so far because I thought it unnecessary. I would like to have your idea about it, as to the continuity of the ore from what we call the
266 top of the south dipping, vein, the continuity of the ore from there, and the vein, down to where the alleged trespass was committed.

Mr. Lindley: Continuity on what you call the strike?

Mr. Dickson: What we call the dip.

Mr. Lindley: I do not suppose there is any question about that.

Mr. Dickson: I supposed not, and have not offered any evidence on that.

Mr. Lindley. I think the model itself is evidence of that.

The Witness: This, of course, does not amount to anything. There is a plan which illustrates what the toe would be like, and the section would be just exactly the same; all you have to do is to revolve it and you are looking at a section.

Q. Start on the 400 level and walk around from the south dipping to the north dipping without interruption?

A. That is right.

Mr. Lindley: Why don't you- plan map of the 400 level show that just as well as that?

Mr. Dickson: Well, I just wanted to get at what he model shows. I have never seen the model. I think that is all.

Mr. Colby: That ought to be labeled, "Chandler 2."

Mr. Dickson: All right; yes.

Cross-examination.

267 Mr. Lindley:

(Q.) Does that show a different situation from what is shown on the plan map, showing the 400 level?

A. Yes, it does.

Q. In what way?

A. On the sketch I have brought a curved line around here showing the change and a continuous tracing on the hanging wall from the north east dipping vein to the south vein. The map shows a continuation of the hanging wall of the north vein extending out through here (indicating). The south vein also shows the same condition.

Q. Your idea is that the point of the toe extended further around and colored yellow, is that it?

A. No, not at all.

Q. There was no toe?

A. There is no toe.

Q. All right. How recently have you seen that model?

A. Several years; I don't know, two or three.

Q. You know where it is now?

A. No, I do not.

Q. Have you had any previous experience in the Tonopah district before you come up here in connection with the MacNamara litigation?

A. Yes, I had had a limited experience in the MacNamara mine. By MacNamara, do you mean the West End MacNamara controversy?

268 Q. Yes.

A. The answer is correct then.

Q. You did not occupy any official capacity in connection with

the McNamara mine, that is, so far as its executive work was concerned until the litigation started?

A. No, I did not.

Q. You were brought here for the purpose of that litigation?

A. Yes, sir.

Q. About the same time I was?

A. I think at the same time.

Q. Well, that was a controversy between the West End Mining company and the McNamara, in which the West End mining company had commenced a suit and secured an injunction against the McNamara working on the north dipping vein?

A. It was.

Q. The question that you and I had to determine at that time was whether there was any apex to the north dipping vein, that would justify the suit?

The Court: Judge Lindley, I do not quite understand this. Do you mean to say that you and Mr. Chandler came in connection with the West end litigation?

Mr. Lindley: Yes.

The Witness: Judge, there was a previous suit between the Tonopah Extention and the McNamara.

Mr. Lindley: Yes, I had overlooked that.

Q. How long between the two suits was it?

A. I cannot tell you the time; it was quite a period of time, more than a year.

Q. Well, at what period of time did you take charge, as Superintendant of the McNamara mine, for the sake of participating in the first instance in the management of the mine; was that before

269 or after the West End litigation?

A. Before.

Q. Had the West End litigation been commenced at the time that you were made Superintendant?

A. No, not as I remember.

Q. Well, there was a prior controversy then between the West End and the Extention?

A. There was.

Q. That was also settled?

A. Yes.

The Court:

Q. Between the McNamara and the Extention?

Mr. Lindley: Yes.

Q. How was that settled?

Mr. Peck: I object to that if the court please, it may have been settled between themselves perhaps, and to their own liking and to their own interest. Certainly neither party to this litigation is bound by it.

The Court: The objection is good, unless it is just preliminary matter.

Mr. Lindley: It is preliminary.

The Court: The objection is overruled.

Mr. Lindley: I will withdraw the question to save a speech. I had forgotten about the Extension litigation.

Q. You, were, however, the superintendant of the McNamara at the time that the litigation started?

A. Yes.

Q. And the contention in that case on the part of the West End was that they had the apex of the north dipping vein?

A. It must have been.

Q. And they secured an injunction against the McNamara to prevent them from working on the McNamara on what they called the north dipping vein?

A. Yes, they did.

270 Q. And the question to determine was the question of whether they had an apex on that north dipping vein?

A. Exactly.

Q. How long was that case in progress?

A. That I do not know; I should say fully a year, judge, perhaps longer.

Q. Were both sides working actively during all of that period for the purpose of preparing for trial?

A. Both sides were doing work and principally in their own ground; entirely in their own ground I might say.

Q. Work of what nature?

A. We were making upraises to the south in our vein at intervals. The West End company by development was trying to get into the vital territory so that they might likewise do litigation work, and they did some; there was not very much work done on either side.

Q. Do you recall a drift which you used to call the apex drift on the West End ground, ground for the purpose of establishing an apex?

A. That we called the apex drift?

Q. A drift along a common boundary line, between the two claims made by the West End company?

A. Do you remember on which level?

Q. Well I should say corresponding to the two hundred level in the McNamara?

A. They drove the two hundred level west during that period a certain distance.

Q. Did they make upraises from that level?

A. Yes, they made one perhaps two; I think no more than that. My memory is not altogether clear in regard to the work during that period; there have been so many periods here of litigation, I am liable to run one into the other.

271 Q. I will see if I can refresh your memory as to the locality and as to your investigation of that particular drift. Do you recall having made any statement of this kind, and if so I wish you would point out on the model what you have reference to: "Was down in the West End to day; started record on the work that they are doing; I found on careful investigation that in the west upraise,

along the side lines, beyond the point of connection with our two hundred level, south cross cut upraise, that the West End people have deliberately left the vein in the foot of the raise; the hanging wall as the vein comes back is splendidly defined under the floor of the raise and they have followed the contact line between the earlier andesite and the cap, and are still driving ahead; there are some small stringers of quartz in the earlier andesite in the raise in spots the earlier andesite is very silicified and altered, but the vein is under the floor of the raise; they are evidently figuring on misleading somebody and will perhaps try to make a vein tracing by the stringer and altered andesite up the raise to a final ending of quartz, etc." "We can bust up any apex showing claimed in this raise by the winze from the raise down under the floor of the vein." Do you recall that?

A. That is perhaps a copy of a letter of mine to you, and I recall the situation very clearly.

Q. I beg pardon it was not to me.

A. Well, it sounds like a letter of mine. That is immaterial. I can recall the work.

Q. Please point it out.

A. First this raise from 202 West drift, which had encountered a vein at this point dipping southeasterly and on which they started to raise; at this point if you will notice it goes into the floor of
272 the raise, which raise continues in trachyte to this level.

Q. You had better number them and give the markings on the model.

A. Well, I said 202 West drift, encountered a vein in the neighborhood of 254 upraise and the raise 258 was started in that vein, but carried into the hanging wall, the vein disappearing in the front of this raise, and not seen, I believe, as far as their development work after that. This was the only vein showing on that level at that time.

Q. Who ran the 5-A raise?

A. The 5-A raise?

Q. Over here in the West End eastern territory.

A. The West End mining company.

Q. At what time?

A. Since the suit brought by the Jim Butler Company was instituted.

Q. 5-A?

A. Oh, 5-A, I am confusing it again with 4-A. 5-A raise was put up by the West End company.

Q. Was it in the McNamara ground?

A. 5-A?

Q. Yes.

A. 5-A is in the West End ground.

Q. And when was that put up?

A. I do not know.

Q. Was it put up at the time that the litigation had been started?

A. When we were examining this country we found that raise.

Q. Did you investigate it carefully?
A. Fairly so, as far as I was concerned at the time.
Q. You say that you paid no particular attention to it?
A. In connection with what we believed to be one vein forming a roll, we did not take it seriously.
Q. What do you mean by 'me'?
A. Myself and engineers and geologists who were employed at that time by the McNamara Mining Company.
273 Q. Who were the engineers?
A. Chas J. Moore.
Q. Anybody else?
A. Professor Andrew C. Lawson.
Q. Professor Lawson.
A. Yes, of the University of California.
Q. Do you recall your discussion of this matter with professor Lawson, this particular raise?
A. I do not think I discussed it with him, as to what moment he considered it to have.
Q. I understood you to say that "we" did not consider it of importance, and I asked you who "we" was and you said Mr. Moore and Professor Lawson.
A. Well I had been in there a number of times but the particular visit that I had in mind we were only in there a very few moments, and it is more of an opinion than anything else. There was not very much time spent in it.
Q. What did that go up on,—that raise?
A. It went up on a vein having a north dipping hanging wall.
274 Q. And you knew the West End were hunting for that kind of a vein, did you not?
A. Knew the West End were?
Q. Yes.
A. Yes, I supposed they would be, if they were trying to apex the MacNamara.
Q. That had been put up by the West End company?
A. It had.
Q. Now, you have a series of raises along there, 5A—enumerate them.
A. 2A, 4A, 5A, 6A, 7A in that locality.
Q. How many of those raises were put up by the West End Company during the old litigation?
A. During the old litigation?
Q. Yes.
A. I don't know that any of them were. I said we found 5A extended—I found 5A driven to the height previously described the first time I went in there after the suit was instituted.
Q. You do not know whether the MacNamara put that up, or whether the West End——
A. Didn't put that up during my time, so far as my knowledge is concerned.
Q. It is in West End ground?

A. It is.

Q. The assumption is it would not have been put up by the MacNamara people?

A. The presumption would be that they did not.

Q. Who else could have put it up, except the West End people?

A. Except the West End people? Well, I am quite sure
275 that it was put up by the West End people.

Q. You said you did not know who put it up. You are satisfied that they did put it up?

A. If I made that statement, I had in mind the Particular administration, whether Mr. Corkill or Mr. Carr had it put up. So far as my knowledge is concerned, it was certainly put up by some one in charge of the West End Mining Company's affairs.

Q. Well, the management changes but the company don't.

A. I see.

Q. So that you are satisfied that that raise was put up by the West End?

A. Put up by the West End Mining Company, yes.

Q. Claiming an extralateral right on the north dipping vein?

A. I don't think they ever made any claims on it.

Q. Well, they commenced a lawsuit against the MacNamara Company, didn't they?

A. They did, yes.

Q. That is on a north dipping vein?

A. They did.

Q. The activities of the MacNamara at that time were in the west country, were they not?

A. Yes, principalpy. The reason I answered I didn't think they based that litigation on that——

Mr. Dickson: On what?

A. On this showing in 5A. raise, is because I do not think they paid any more attention to it than the MacNamara Mining Company
did, or they would have gone ahead with their raise to establish
276 that, if they thought that was an apex.

Mr. Lindley:

(Q.) You know that at that time they were claiming the apex of the north dipping vein, and claiming the ore bodies in the MacNamara ground on that vein?

A. Yes, they were.

Q. They did not take you into their confidence to tell you what they were claiming it on, did they?

A. No, that is quite true.

Q. And you had to guess, we all had to guess just what their contention was.

A. I did, yes.

Q. And your object in life about that time was to show that there was not any such north dipping vein or an apex of a north dipping vein that would give them an extralateral right to take the MacNamara bodies?

A. Yes.
Q. That is what you were there for?
A. That is what I was after.
Q. Now, 5A, then, was run at some time prior to the litigation, or was there when you made your investigation, you do not know when it was run? How many other raises are there parelleling that in that immediate vicinity? You did not know when it was run; it was——
A. No.
Q. When you came on to the ground it was there?
A. Exactly.
Q. Now, how many other raises are there parelleling that raise in that immediate vicinity?
A. Well, there are four that are driven approximately parellel to that raise, in that immediate vicinity.
277 Q. When were they driven?
A. They have all been driven since the institution of the present suit.
Q. Who instructed them to be driven?
A. Mr. Brady, the general manager of the West End Company.
Q. Under whose advise and direction?
A. Under the advice of the engineers employed in the controversy.
Q. Plus anybody else?
A. My own advice.

Mr. Dickson:

(Q.) I cannot hear.
A. Plus my own recommendation.

Mr. Lindley:

(Q.) Now, let us go back to the background of these running supplemental upraises. I understood you to say that you entered the employ of the West End in the first place in a consulting capacity, for examination about their properties, and consulting them in connection with the workings of the mine. At that time, who was the general manager of the West End?
A. Mr. S. H. Brady.
Q. Where is he now?
A. I do not know.
Q. You succeeded Mr. Brady, did you?
A. I did; not as general manager, however.
Q. No, they reduced the name of the office, I suppose?
A. Yes.

Mr. Dickson: How is that?
Mr. Lindley: They reduced the name of the office from manager to superintendent.

278 Q. Well now, what were your functions—at the time you were first employed by the West End Company, you were not employed in the capacity of superintendent?

A. No.

Q. What were your functions and duties?

A. The understanding of that employment of me was that I be subject to call at any time that I was in the camp to advise on any underground situation or complexity that might arise, and at the same time, if called upon to make outside examinations for the Company.

Q. Were you under a regular salary or were you to be paid simply for your work as it was done?

A. I was under a regular salary.

Q. Which included fees for examination outside?

A. That was to be extra, outside of the camp.

Q. You had a definite salary, then, as consulting engineer, involving the workings of the West End Company?

A. I did.

Q. And were you frequently consulted by Mr. Brady?

A. Not at all so.

Q. At the time you were employed as consulting engineer—during Mr. Brady's administration, you were not consulted, is that it?

A. Only several times; a couple of times, perhaps.

Q. Well, can you tell us what that consultation was about?

A. Those several instances?

Q. Yes.

A. In regard to the structural conditions underground, as to my opinion of a certain situation; what work I thought ought to be done to get the best results.

279 Q. How many occasions of that kind were there?

A. I really do not remember, Judge. There were very few.

Q. You never undertook to do anything unless Brady called on you, did you?

A. No, I did not.

Q. And he called on you rarely?

A. Yes.

Q. Do you recollect the period of time, the exact date of your employment by the West End in the first instance?

A. I could look that up for you, Judge.

Q. What is your impression?

A. Of what?

Q. Of the time?

A. Four or five months, I think.

Q. Four or five months ago.

A. No, previous to this——

Q. To this litigation?

A. Litigation.

Mr. Lindley: Mr. Clerk, what is the date this suit was commenced?

The Clerk: April 6th.

The Witness: The West End Company's office records will fix that time definitely, if you wish it.

Mr. Lindley:

(Q.) You knew the position of the underground works of the West

End Company, that is, in the lower regions of its works at the time you became employed as consulting engineer?

A. No, I had not been in it.

Q. Do you know whether or not their works had reached underneath the Jim Butler surface?

280 A. I didn't know that, either.

Q. You did not know that?

A. Just a minute; I will consider that a moment. You asked whether at that time of my employment, I knew whether or not the West End workings had reached the Jim Butler line; was that the question?

Q. Yes.

A. I didn't know it of my own observation. I had heard so.

Q. You had heard so. From whom did you hear it?

A. I can not recall where I did hear it first. It was heard casually.

Q. Did Mr. Brady tell you?

A. First?

Q. At any time?

A. Yes, in going over the maps, it was perfectly apparent later on.

Q. I mean before your employment in connection with this litigation?

A. I don't think Mr. Brady ever told me.

Q. But you think at that time they had reached the boundary line of the Jim Butler?

A. It seemed to be a fact more or less commonly known. I heard it mentioned, but as I say, I had not verified it. Later on, when I saw the maps of the Company, the stopes showed for themselves.

Q. Well, at the time of your original employment, you had no idea at that time that there was any controversy coming up between these two companies?

A. I had not, no. I had understood that certain differences in regard to mining across the south boundary of the West End had been adjusted by agreement.

Q. Across the south boundary?

281 A. Of the West——

Q. Or the south side line?

A. Yes.

Q. Well, that had reference to what vein, if you know?

A. I have heard it said the south vein. I didn't know what vein.

Q. Can you identify that vein on the model there?

A. Well, in that region there is but the one vein, so I suppose that——

Q. In what region?

A. The south west portion of the territory.

Q. There is only one vein?

A. Only one vein, yes.

Q. And you disagree with Mr. Wiley as to that?

A. I call this south. I recognize the south branch of the south vein, not calling branches separate veins.

Q. Then, is the Fraction vein a branch vein?
A. I consider it is.
Q. Therefore, it is a part of the main vein?
A. I would so consider it.
Q. It is not a separate vein?
A. I don't think so.
Q. Well, I understood you to start out with the statement that there were three veins in this property, and you have given us two; where is the third?
A. It is the vein encountered lower down in the shaft on the 8 and 9——

Mr. Dickson:

(Q.) How much lower down, if you do not object?

Mr. Lindley: I do not object to anything that you do,
282 Judge.

A. Encountered in the shaft about 550 feet lower.

Mr. Lindley:

(Q.) Is that what they call the lower contact?
A. I believe it is designated so.
Q. That cuts no figure in this case?
A. I believe not.
Q. You left us guessing as to what you meant by a third vein and I thought I would bring it out. And eliminating your lower contact, you do not think there are but two veins on the property?
A. With the explanation that I just made in regard to the south branch of the south vein, the Fraction vein.
283 Q. Well, you say that they are all one?
A. Yes, that is right, two veins with the exception of that lower one.
Q. How thick are they at the thickest point? What would be the thickest part of this vein which you include in your designation as the south dipping vein. How thick is the ore body, how thick is the vein?
A. Well, it is a very wide vein, we are stoping widths, and there have been widths stoped recently as wide as twenty-five or thirty feet, perhaps more. In other places it is stoped to a small width, as, oh, five or six or seven feet.
Q. Take from the hanging wall of the fraction vein to the foot wall of the lowest vein, what is the vertical distance?
A. From the hanging wall of the fraction vein?
Q. Yes, to the lower working of the——
A. At what point?
Q. At the thickest point?
A. Thickest point on which vein?
Q. You say that there is only one?
A. Well, but you are having me now consider the fraction vein, as a branch of it?
Q. You say that it is all one vein.

A. I say that it is a branch of the south dipping vein, but I do not give it, or I do not distinguish it on that account as a separate vein. It is a branch vein, if you want to consider it a separate vein I am perfectly agreeable.

Q. Mind you, Mr. Chandler, you are testifying.

A. I am trying not to——

I consider it a spur or a branch, Judge Lindley of the main south vein, and only that, I do not designate it as a separate vein in that connection. It has a separate name we know it as the fraction vein.

284 Q. Well, what is there between the two?

A. Well rock.

Q. Mineralized?

A. In places.

Q. From the bottom to the top?

A. Of what?

Q. Well, from the bottom branch to the top branch?

A. No.

Q. Vertical?

A. No, not that I am aware of.

Q. Then you do not think the Fraction vein ought to be classified as a distinct vein, it is simply a branch of the main vein, that is a way you engineers have of designating these things as branches, spurs?

A. It is a vein designated as the Fraction vein, is found at a considerable distance from the main West End vein, but on our four hundred level in the territory of 422-S and as it is followed down approaches an intersection with the main south vein, and is at the present time within a few feet of being connected.

Mr. Lindley: Well, I do not understand Mr. Dickson, this is addressed to you particularly, that any part of this alleged trespass by the Butler Company, is on what we call the Fraction vein?

Mr. Dickson: The alleged trespass by the Butler company?

Mr. Lindley: By the West End Company in Butler surface.

Mr. Dickson: That is my understanding, that it is on the main south vein.

Mr. Lindley: And above the junction of the two branches, if you call them branches? That is my understanding.

Mr. Dickson: That is my understanding too.

Mr. Lindley: That Fraction vein cuts no figures in this
285 case, so far as this case is concerned.

Q. The geological feature as I understand it, Mr. Chandler, that is involved in the discussion of the structural conditions; is that right?

A. Yes.

Q. And the same way with what you call the south branch?

A. Yes.

Q. Now, we will come back to the point where you emerged out of the employment of consulting engineer——

A. Pardon me just a minute—you said that it cut no ice in this litigation, in this suit.

Q. I mean so far as the damages are concerned.

A. You apply that also to the south branch of the south vein?

Q. Yes.

A. It differs in that respect from the Fraction vein in that it may cut some ice in this litigation, the south branch of the south vein.

Q. It may. Well, we have not been adbised if it does.

A. I wanted to make that explanation however as distinguishing it in that respect from the Fraction vein.

Q. I would like to ask you what you mean by that?

A. You want to know what I mean by it?

Q. Yes. You said that it may cut some figure?

A. Because there are workings in the south branch of the south vein, south of the south side line of the West End company's ground; and I do not know anything about it but it occurred to me that it might, on that account be involved perhaps in an alleged trespass, and extraction of ore.

Q. That is a legal question fir the lawyers to settle isn't it?

A. Yes, I believe so.

Q. No, justification in the pleadings for anything except this vein one vein, however, we will pass along now. Now, I want to get back to the time where your relationship to the West End
286 company merged from Consulting engineer and outside investigator to the point of time when they approached you with reference to a change in the nature of your employment. How long after you had been originally employed in the capacity of consulting engineer was the subject of controversy with reference to this vein broached to you and by whom?

A. Well, almost at the same time that the suit was instituted or a few days after that. I was called by Mr. Brady and had a conference with him.

Q. I believe you stated in direct what your statement was, you did not state it was to Mr. Brady, but it was with Mr. Brady that you had this first conference?

A. Yes.

Q. This was after the suit was brought?

A. Yes, sir.

Q. What was the nature of the conference so far as your employment was concerned?

A. Any rearrangement?

Q. No I do not care anything about your financial conditions at all. I mean in reference to your duties, and in reference to this controversy. I do not care anything about the money nature of it at all.

A. I was asked to tell him what I thought of the situation.

Q. Didn't you?

A. I did.

Q. What did you tell him?

A. I told him of the position that I had taken and believed in

in the case of the McNamara against the West End, and that I had not seen any developments since to lead me to change my views.

Q. Did you tell him at that time that in order to change
287 your views you would have to do a whole lot of work?

A. I told him that it would certainly be necessary to bust up this apparent toe to a roll, and to show that no roll existed, if he were to have any case in my judgment.

Q. Had you in mind at that time how you were going to bust it up?

A. Well, I was going to develop the fact in this east territory where we believed a toe to exist, by east drifting on both of the hanging walls, and see whether or not they would unite and form one common hanging wall.

Q. What did you say to him about that 5-A upraise?

A. He asked me—I didn't even remember that, when we had our first conversation, but several days later I recalled it and I went to him and I told him I knew of a certain upraise that we ought to look up and see what we thought of it.

Q. Why?

A. Because that was the only place that I knew of where there was any development other than the apparent fold in the west end of the ground, and this apparent toe that would shed any light on the situation.

Q. Brady knew of course that you had been employed by the McNamara in the former litigation, did he not?

A. He did, yes.

Q. You suggested to Brady right hot off the bat that that was a good place to start in work?

A. Not right off the bat.

Q. No, not right off the bat?

A. No, after several days' deliberation.

Q. Did you go down into the mine with him?

A. Yes, sir.

Q. At that time?

A. I think the first day I mentioned it to him.

Q. Was that the first place that you went to?

288 A. I really could not say.

Q. Don't you recall that trip now; where did you go; what started you; what drew your attention to the condition of that upraise; what had there intervened between the time that you left the employ of the McNamara until you assumed the position on this litigation, what had occurred to call you- attention to that upraise, if anything?

A. Because, if I recall the conversation correctly, he asked me if there was any showing whatever, or any place that seemed to argue against my theory of a perfect anticlinal roll or fold, and that was the way that it came up.

Q. That upraise?

A. I said that was the only place that I knew.

Q. And yet at the same time you testify that when you were

making a fight for the McNamara company, you paid no attention to that?

A. Paid very little attention for the reasons stated.

Q. How long a period elapsed between the time that the litigation of the McNamara Company and the West End ceased, and the time when you took this upraise matter up with Brady? How many years?

A. It was a number of years, Judge, three or four years anyway.

Q. Wasn't it longer than that Mr. Chandler?

A. It may have been. I would have to look that up.

Q. Well, we were busy as I recall it in January, 1908, on this apex question.

A. With the West End?

Q. Yes.

A. 1908——

Q. That is the date of your letter January 1st——

A. Well, I was here in Tonopah,——

289 Mr. Colby: January 15th, 1908, is the date of the letter.

A. I was away from Tonopah approximately three years, between 1910 and 1913, and returned to the camp last October.

Mr. Lindley:

(Q.) Well, it is five or six years?

A. That would make it nearer five years than three.

Q. Nothing in the meanwhile had necessitated calling your attention to this upraise?

A. No, I had not been in the camp for three years.

Q. Forgotten all about it?

A. I had practically.

Q. That was the first *natter* that brought it up?

A. About my employment?

Q. Investigating the merits of this controversy between the Jim Butler and the West End?

A. No, it was not the first thing, as I understand—I didn't recall that raise for several days after he called me in for the first conference.

Q. I mean that you did recall that out of the recollections of six years?

A. I did.

Q. And the result of that,—some parallel upraise- were put up?

A. Yes.

Q. Will you designate those parallel upraises; designate them so that we can get them in the record.

A. 2-A; 4-A; 6-A; 7-A in that vicinity.

Q. What is there shown in any one of them that is not shown in 5-A?

A. Practically nothing judge. There is a feature in 5-A however that is not shown in the others.

Q. What was the object of running so many?

A. Well, to show how extensive this condition in five-A was.

290 Q. Wouldn't a drift be much more economical and much more satisfactory than a number of upraises of that kind?

A. There would be a danger in that because the top rock is very irregular, and the surface under it, with numerous faults, and you would be very apt to get into trouble running an intermediate drift, and attempting to work from that.

Q. If you were mining that ground you would not run that number of upraises?

A. For stoping purposes?

Q. Yes.

A. No.

Q. You would not?

A. As far as this drift is concerned this raising could be done far more advantageously.

Q. Well, practically, as I understand your testimony,—I want to be perfectly fair with you for a great many reasons.

A. I want to be the same with you certainly.

Q. Practically there is not anything shown in the supplemental raises except what is shown in 5-A?

A. That is practically the case.

Q. Why did you run so many of those raises right at that section of the mine?

A. Well, I did not space those raises. I had nothing to do with it. They were run there, as I say, manifestly with the object of finding out in this territory back of the alleged trespass, whether this condition in 5-A was purely a local one, or whether it had a chance to develop into a general condition.

Q. Are those raises run on a hanging wall?

A. They are.

Q. Where is the foot wall of the vein that is shown in those raises?

A. In places in the raises it is in evidence; in other places the width of the workings does not show,—the height of the
291 working does not show the entire vein.

Q. What is there below the bottom of the vein?

A. In any particular raise?

Q. What is the character of the intervening rock, between the hanging wall, shown in these raises, and the stope, or the red vein below?

A. Well, there is wall rock.

Q. Unmineralized?

A. Well, very slightly mineralized in the foot-wall of the vein, as exposed in these raises.

Q. Is there a clean foot wall shown in any one of those raises?

A. I have not seen one.

Q. You have not seen one? Then how do you know what is underneath?

A. We have a connecting raise here. It has no number, it is practically a vertical raise, located almost directly under 5-A raise, which raise starts on the back or hanging wall of the stope below in the south vein, and is driven to a connection through country rock to the vein in 5-A raise.

Q. Absolutely country rock?

A. What do you mean by absolutely country rock?

Q. Nonmineralization, nonsilicified—no quartz at all.

A. It is slightly silicified trachyte, as I find in a number of localities in the mine.

Q. Isn't it a fact t-at you put those upraises there because that is the only spot in the mine where you could get that result?

A. This raise, 5-A?

Q. Yes.

A. No, because we have the same result in other raises.

Q. Where?

A. 302 for one.

292 Q. Now let *is* take 302, tell us a little about 302.

A. Well, 302R, starts from 302 east drift and follows a south dipping vein.

Q. And——

A. And at the point indicated by the change of color, encounters heavy massive quartz, belonging to the north dipping vein, whose hanging wall is encountered as shown, and on which the back raise 366 is continued on the same north dip to a termination of this quartz and this vein against cap rock, about ten feet below the two hundred level.

Q. I notice that you have drawn the line of demarcation between the red and yellow before you turned to the north dipping vein. Why did you do that? In other words as I look at the point that you have just been testifying to, to be on a red vein, and then change to yellow, and still it is south dipping. What justification is there for the drawing of the red line at that point?

A. It is absolutely impossible in this section, this territory of juncture to tell where the north dipping quartz begins or the south dipping quartz ends, in the foot wall, so to a considerable extent that change of color is an arbitrary point.

Q. That is an arbitrary proposition. Is that the same arbitrary proposition applied to the McNamara West End stope in the neighborhood of your raise-A?

A. In the foot wall—yes.

Q. Of the stopes as shown upon the model, and as a line of demarcation is shown upon *on* the stopes——

A. Did you say raise A?

Q. I said underneath raise A. To make the question a little more elaborate Mr. Chandler, you have on your model,—and I have only that way of designating it,—I am speaking of *of* what you

293 testified to, as the original instance of their being evidence to you of a roll in that vein in the workings of the McNamara and West End.

A. Yes.

Q. You recall that circumstance? That was one of the circumstances that there was no question about at that time?

A. As a perfect evidence of a roll.

Q. Yes. Now, what justification have you for eliminating the yellow for the red?

A. For the reason that we follow up on this south dipping vein, it is exposed for thirty feet, and at other points over to here.

Q. Now, we will get lost if you do not identify this. How far are you away from the place that I have called your attention to; measure the place and take the ruler. Now I was asking you about the conditions shown in the stope of the McNamara and West End immediately in the vicinity of raise A and you went over to what point—give me the distance?

A. You mean 302?

Q. Yes.

A. I will give you this approximately. I suppose that is sufficient.

Q. Yes, that is enough.

A. Approximately 440 feet.

Q. 440 feet. Then explain the situation why you have marked one vein red and the other yellow, you go down to a point 400 feet to the east of it. Will you kindly confine your explanation, if you have one to make, as to why the stopes where they come together with the red and yellow, you have eliminated the yellow and marked one red, marking the other one yellow?

A. There is no reason that I can refer to in making an explanation, other than of raise 302.

294 Q. If you permit me to call this a roll as we both used to some time ago—this roll is plainly observable matter, it was when you first made your investigation in behalf of the McNamara and is to day, is it not?

A. As far as what we may term the common stope is concerned,—yes.

Q. Well, what was there, or is there to day that justified the marking of one of those veins red and yellow, and the line there that is marked—observable in those stopes?

A. Just this; that we can and do follow the same hanging wall that we have in this stope up into A raise.

Q. I am asking for a justification for the marking of those lines as they are marked——

Mr. Alling: Just a moment if the Court please, he is showing that A-raise is the justification. And we submit that he be permitted to conclude his answer, because it is directly responsive to the question.

Mr. Lindley: As this is the first time that I have had the pleasure of listening to Judge Alling, you can adopt his suggestion.

Q. Now leaving the raise out and going *and going* to each side,—we are bound to get there sooner or later.

A. Now, Judge Lindley, if we remove A-raise in its entirety we have the same condition to day as we had during that period of the West End Mining Company controversy.

Q. There was no physical line of demarcation to determine one line from the other?

A. Not that I had observed at that time. I believed that it was a perfect fold.

Q. Well, you made some pretty severe study of that situation?

295 A. I made careful study of it.

Q. There was a whole lot involved?

A. In that suit?
Q. Yes.
A. Yes.
Q. The life of the McNamara mine was involved, and you would not miss anything?
A. I tried not to.
Q. I don't think that you did.
A. I am sure that I did. I missed this much Judge Lindley, that I did not observe that at that time that there were several slips in the immediate vicinity of the hanging wall of this stope. I believed that there was one hanging wall joined the two stopes. Careful study since that time has shown me that the hanging wall of this McNamara stope extends continuously up A-raise, over and above the south dipping vein.
Q. Well, if you had made that discovery at that time, the McNamara would have lost out?
A. That I am not prepared to say. On that one development do you mean, it might only have proven to be a very local displacement, and if we had established a perfect fold or anticline, this condition in A-raise would probably have been considered very local, and so I don't know where——
Q. You do not seem to have put any other parallel raises up in that neighborhood?
A. No, the next raise is 302.
Q. Four hundred feet away?
A. That is,—part of that was also put up from the south vein, the portion numbered 302 raise—that part of it.
Q. Well, taking us back to the old days, if that A-raise would have been put up, wouldn't you have classed that in the same class as you did the other raises, and stated that it was a
296 fake raise, to show an apex?
A. No, not at all, I would not have classified it as a fake raise at all. I would have seen the same fact that I do today in that raise, that it actually does follow the hanging wall of the north dipping vein, through the stope.

(Question read.)
Mr. Peck: I object to that as impugning the integrity of the witness.
Mr. Lindley: I want to say now, once and for all that I am not trying to impugn the integrity of this witness, I think that the defendant is a corporation, it has no soul, and it doesn't make any difference. As far as this witness is concerned, I desire to say that he has no substantial reason for changing his opinions.
Mr. Dickson: Well, I think that we have a right to object to the term "fake raises."
Mr. Lindley: Well, I may have converted his language in the letter which I read. He said "endeavoring to mislead" and I should have used his own language and said "misleading." Well, now are we at peace once more.
Mr. Dickson: Oh, yes.

Mr. Lindley:

Q. Now I will ask you if the A-raise is not run precisely on the same slip that that drift was run, for apex purposes by the West End company at the time of the McNamara litigation?

A. On the same what—what did you say?

Q. Fault or slip or whatever you call it?

A. Which drift?

Q. The question you testified to and referred to in the letter. Am I correct about that matter.

297 Mr. Colby: The raise.

Mr. Lindley: Let me have that letter a moment.

A. No it is not.

Q. You are sure of that?

A. I am.

Q. You thought that raise-A in that section of the mine, was the only one that was necessary, is that right.

A. I thought that it was the only raise necessary to show the condition which it does show, that instead of having a common hanging wall for both these stopes, that this hanging wall extended above the south dipping vein.

Q. Why should you put one up there and six down in the other section of the mine?

A. Because the alleged trespass was in that portion of the mine; the extraction of ore and damages claimed, so I presume the West End Company was much more diligent in that portion of the ground.

Q. The West End Company represented by whom?

A. Well, in the laying out and deciding and ordering and inspecting of this work—its general manager was Mr. S. H. Brady.

298 Q. What have you to do with it?

A. In locating it?

Q. Yes. Didn't you take charge of that matter?

A. No, I didn't have charge of it.

Q. Not of the actual working, but the laying it out?

A. No.

Q. Who did?

A. That work was decided on by Mr. Jussen, Mr. Wiley, Mr. Winchell, Mr. Brady and Mr. Richardson.

Q. Well, of course these gentlemen must have got from you the conditions of the original 5 A upraise?

A. I pointed that raise out, as I have testified, to Mr. Brady.

Q. Then these upraises were run by common consent of all the engineers in the case, is that it?

A. Yes, with their approval.

Q. And they thought it was necessary to run 5 or 6 down there, and only one up at the upper end?

A. Well, you will have to ask them, Judge.

Q. Well, what is your part?

A. I can tell you what I thought. As I explained just now——

Q. You have told us what they all thought as to the lower end, as to the lower section, but you have not told us what they all thought about the upper section in the neighborhood of raise A?

A. This work was done first in the east end of the ground, and this A raise work was done later, and we had dropped over on to the south side and had started three different raises with the idea of developing the conditions from the south vein side and made a diligent effort to do that but got into trouble in all of
299 those raises owing to the numberous interferences by faults in this section of the mine.

Q. Well now, speaking of the concentration over at that end to reach the trespass. You know, as a matter of fact, don't you, that there are stopes in the west end of the property that are underneath the Butler surface, and that the trespass is not confined to the east end?

Mr. Dickson: Let me ask you, Mr. Lindley, wasn't it your understanding at the time we entered into a stipulation, that it limited the scope of that injunction to a point 700 feet westerly from the end line. What was spoken of in that agreement in December, 1912, as the south vein, was *was* involved in this suit?

Mr. Lindley: I am afraid you are mistaken about that, Judge, unless I am. When those stipulations were drawn and we drew that north and south line, the injunction did not operate, it was done specifically without any waiver of right to any other part of the vein.

Mr. Alling: I would like to ask Judge Lindley if it is not true that the amendment which he has recently asked to the Complaint was not practically to cover ores in the western area alone?

Mr. Lindley: No sir.

Mr. Dickson: At that time, at the time the injunction pendente li-e was issued, pursuant to our stipulation, and which extended the scope of the injuncion only from the west end line *tline* of the west end claim to a point 700 feet westerly thereof, the West End company at that time was engaged in stopeing of the vein way to the west.

Mr. Lindley: Well now, Judge Dickson, I do not care any-
300 thing about this, but the real fact that that section of the mine was not involved in the south vein contract. My motive was simply eliminating that from the injunctive order, because I did not want to thresh out the merits of that on an injunctive order. In response to the question put by Mr. Alling, let me say that I do not know, Mr. Alling. It was reported by the management of the mines, when I suggested to them that we would have to present our evidence as to the volume and value of this trespass, that they should get their stope cross sections, and they reported to me upon the measurement of the stopes that we had underestimated or understated the volume of the trespass, and I do not know what the management had in mind, whether it was in the east or west, or both. I do not know.

Mr. Alling: I know that two affidavits filed here, which, taken

together with the Complaint and the express statement of Mr. Colby, amounted to an express disclaimer on the hearing of the temporary restraining order as to the inclusion of any ores taken out on the western end.

Mr. Lindley: Mr. Alling, we will go back to the stipulation signed in writing, because I was there. That question came up between Judge Dickson and myself, and I think you were present, and the stipulations will show themselves, because I put in a modification there to protect our rights in that section of the mine. We did not ask for an injunction because it was involved in a contractual relation, and I did not want to mix it up.

Now, whatever is the right thing will be done under the pleadings. I understood that you gentlemen were surprised by the increase in the volume. But it is entirely immaterial. We
301 can thresh that out when the Court determines the title.

Mr. Dickson: Do you misunderstand me. I do not undertake to say that by any action you have waived any right that you have to this portion of the vein. But I got the impression, no doubt as the witness did, that whatever was taken out of this so-called south vein, was not involved in this suit at the time the injunction was issued.

Mr. Lindley: Well, Mr. Dickson, the suggestion is made that this period of time, that those upraises were run before the injunction order was issued, I think.

Mr. Dickson: I do not think so.

Mr. Lindley: We will straighten that out. I see what the witness thinks, that this is the area of greatest activity and the necessity of duplicating upraises to protect the ore bodies below; that is what his idea was, at least. However the lawyers may be mixed on it, the witness seems to be prefectly clear.

The Witness: That was my idea, Judge.

The Court: We will take a recess at this time. The case is continued until a quarter of four.

(Short recess taken.)

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley:

(Q.) Mr. Chandler, referring once more to this ancient and honorable stope up here, the MacNamara West End stope, in the vicinity of raise A,—and the reason I refer to it as being in the vicinity of raise A is because that is the only marking there is on the model.

A. Yes.

302 Q. Referring to those stopes, did the MacNamara stope over that roll, if you will let me call it a roll?

A. Yes, they stoped to the boundary line.

Q. They stoped clear over to the boundary line which is marked in black on that stope?

A. They took all that was coming to them.

Q. Well, all at one stope?
A. All is one stope.
Q. Is there any difference, any change in the ore shoot?
A. In what respect, values?
Q. Yes sir.
A. Width?
Q. Yes, values?
A. I don't believe that the values were materially different in either the stope painted red or yellow. I say I do not believe that they were materially different; there were, of course, variances, there are every day.
Q. Don't it strike you as being quite common for two veins to unite, but rather uncommon for two ore shoots of the same grade and quality and character to unite?
A. Well, I don't believe I have ever before seen stopes or known anything about the grade in the territory of intersection of two veins, so I am not prepared to say whether that would be an unusual condition or not.

Mr. Lindley: That is your answer. Take the witness.

Redirect examination.

Mr. Dickson:

(Q.) I will ask you to assume that you have two fissure
303 veins forming a juncture in their upward course, and to assume that they were mineralized at the same time, solutions circulating through the fissure, we will say here in the north dipping vein and the fissure also in the south dipping vein, I will ask you, in your opinion under those conditions if there would be anything unusual in the fact that where they met and formed one stope, that you would have the same thickness of ore and the same value on the top of the one fissure as you had in the top of the other fissure in the plane of intersection?
A. That is a long question.

Mr. Lindley: Well, I understood the witness to say that he had not experience enough to answer that question.
The Witness: That is the only situation of that sort that I have ever had anything to do with in an operating way, and based on that, I am not prepared to say whether it is an unusual condition.
Mr. Lindley: That is what I understand. Oh, Mr. Dickson, I have omitted something; will you permit me to return to the cross examination?
Mr. Dickson: Why, certainly. I may have to ask the same favor often.

Mr. Lindley:

(Q.) Do you know a fault any where shown in this mine called the Polaris fault?
A. We have that name applied to a certain line of faulting. I was not aware that it was a common term, however, in the camp.

Q. Well, you have heard it called Polaris fault?
A. Yes, I have heard a certain line of faulting referred to, and we have named that the Polaris fault.
304 Q. Jocularly?
A. Not at all.
Q. Seriously?
A. Seriously; in order to have a name for it.
Q. Well, now, where does that Polaris fault figure on this mine, or any portion of it?
A. It coincides with the plane of the north vein for a considerable distance; how far, I do not know, because I have not traced it.

Mr. Dickson:

(Q.) What portion? Point it out.
A. The hanging wall in all these raises, and in other workings show- certain signs of movement. Gouge, with markings and carrying, in a great number of places, a certain width, from a few inches to a foot or more of typical breccia. And that plane of faulting we—I say we, the engineers of the West End Company, have named our selves the Polaris fault.

Mr. Lindley:

(Q.) Are those upraises put upon the Polaris fault?
A. They follow the hanging wall of the north vein, which I have described as the line of that faulting, yes.
Q. Polaris fault. How far does that fault extend down in the mine—any part of it?
A. Well, there are no workings below this——
Q. How far does it extend to the West? I understood you to say that there were no workings to indicate it. Can you trace that fault through these mine workings?
A. I am balled up there. There seem to be several questions, Judge.
Q. Can you trace the Polaris fault, other than what is shown in those upraises? Can you find it anywhere else?
305 A. I have never traced it beyond this Edwards fault. It may on the displaced segment of the vein Northwest of the Edwards fault be again in evidence. There is evidence of faulting on the hanging throughout——

Mr. Dickson:

(Q.) The hanging of what?
A. The hanging wall of the North vein throughout this territory. Whether or not it is a separate faulting, or whether it is a continuation of this same fault, I do not know.

Mr. Lindley:

(Q.) Does that Polaris fault continue to be the hanging wall of the North dipping vein below what you call the intersection of the red vein?
A. It does.

Q. Where?

A. In raises 494 and 498, which are a downward continuation of raises 7 A and—well, 5 A, say, intermediate.

Q. Are the MacNamara stopes in the West section of the mine on the Polaris fault?

A. I explained a moment ago that there is a plane of faulting on the hanging wall in the western workings of the MacNamara, but whether or not it is the same fault that we term the Polaris fault in the eastern section, I don't know.

Q. Is raise "A" on the Polaris fault?

A. I just answered that question, I think, Judge.

Q. Well, won't you kindly answer it for me again? I was talking about the stopes and I simply confine myself now to raise "A"?

A. I do not know whether it is or not, because I do not know whether this faulting in the hanging of the westerly workings is the same as in the easterly.

306 Q. Have you undertaken to trace that Polaris fault in the different sections of the mine other than where you have testified?

A. No.

Q. You have not?

A. I have not.

Q. And you do not consider that that Polaris fault was a structural feature of any value?

A. Well, it is in the hanging—it coincides practically with the hanging wall of the vein, in fact, forms the hanging wall of the vein there, and so long as you follow the vein, why——

Q. You do not know that it is the hanging wall in the west country?

A. I do not know whether the Polaris fault is, I know that there are plenty of evidences of faulting in the plane of the vein in this west territory.

Q. But you do not identify that as the Polaris fault?

A. I never have identified it.

Q. And the only place you have identified what you call the Polaris fault is in the section of these raises, 4 A, 5 A, etc.?

A. That is where we gave it its name, in this locality, and I have never tried to extend it as the Polaris fault in any direction. I did not consider it of enough importance to try to trace it out. I know perfectly well that there is a similar condition west in this vein on the plane of the hanging; similar condition of faulting.

Q. Do you know anything about a fault sometimes called the Siebert fault?

A. If it occurs in——

Q. You can answer that question categorically. Do you know a fault sometimes called the Siebert fault?

307 A. I have heard of such a fault.

Q. Can you identify it as being the same as the Polaris fault?

A. I do not know where the Siebert fault is.

Q. You never have identified it in the ground?

A. I never have.

Q. Have you read Spurr's Monograph?

A. I have looked into it a number of times; I know he refers to it but I do not recall its locality.

Q. You did not try to hunt it up?

A. No, there are too many of them.

Q. There is a difference between faults, is there not, what we call a major fault and a minor fault?

A. Referring to the amount of displacement caused by each?

Q. Well, in any way, to compare them.

A. I never have classified them that way.

Q. You never have. Well, the dynamic geologists do classify them that way; you know that, don't you? Withdraw that question. The term major and minor does involve a distinction as to importance, does it not?

A. Yes, it indicates—probably used to indicate a large displacement in one case and a relatively small one in the other.

Q. Is the Polaris fault a major or a minor fault?

A. That I do not know, because I have no way of measuring any displacement caused by it.

Q. There are several faults in the mine that do create substantial displacements, aren't there?

A. There are.

Q. Are those major or minor faults?

A. I say I have never classified them as such. I will
308 answer that there are several faults in the mine that caused quite large and more or less serious displacement.

Q. But you do not think that this Polaris fault caused any displacement, did it?

A. The Polaris fault, lying in the plane of the north vein does not interrupt the continuity of the vein; it does not fault it and cause displaced segments.

Q. Well, it is the vein, then? So far as it follows the fault it is the vein?

A. So far as it follows the fault.

Q. So far as the vein follows the fault, they are identical, the fault and the vein? Veins are all the result of faulting, are they not?

A. Well, fissuring, generally, yes.

Q. Well, that is all you can tell us about either the Siebert—You say you never identified the Siebert fault at all?

A. Never identified it underground.

Q. All you know about the Polaris fault is what you testified to, is that correct?

A. Well, I think that would cover it, Judge Lindley.

Q. You do not recognize it at all in the west section of the mine?

A. In this section of the MacNamara?

Q. Yes, the west section.

A. No, I do not.

Q. You do not correlate anything, any occurrence in the west

section of the MacNamara workings with what you call the Polaris fault?

A. You asked me if this was the Polaris fault. I said I did not know. If you want me to give my opinion, I will say I believe it to be the same plane of faulting that occurs in this segment to
309 the east of the Edwards fault. It would be perfectly natural because the Edwards fault is a fault which displaced the vein, and, therefore, a post mineral fault, and if this faulting was in evidence here, I would naturally expect it to be in evidence here (indicating.) That is all I can say in regard to that.

Q. How could it be post mineral if the vein is in it?

A. The Edwards fault.

Q. The Edwards fault is a post mineral fault. Then, your idea is that all of the yellow vein exposed on this model is in the Polaris fault?

A. Yes, in the sense that I have just described it.

Q. Does that faulting, or the hanging wall of that faulting constitute the cap rock? Is it a contact with the cap rock?

A. It reaches the cap rock.

Q. Is it the contact of the cap rock?

A. Why, no, the hanging wall of the vein is trachyte throughout a considerable extent; the fault in the hanging and the vein, you cannot mark the contact upon cap rock only where a raise is extended to reach the overlying cap rock, which might be so termed.

Q. You cannot stand for that?

A. I cannot stand for that, no.

Mr. Lindley: That is all.

Mr. Dickson:

(Q.) The Polaris fault, or the fault in the West end of the MacNamara stoping, if it be the Polaris fault, on its course upward, does it reach the cap in its upward course?

A. Yes, it does.

Q. Now, what you have designated, you engineers of the West End people, as the Polaris fault at the east end, I will ask you if
310 that is disclosed in the 400 level, where you have 461, 466?

A. Wherever we find the hanging wall——

Q. Down to the level, on this level (indicating)?

A. I know, but we find the hanging wall on this level and I was making the general statement that where we reach the hanging wall we have this fault in evidence, as it is above the level and in the raises.

Mr. Dickson: That is all.

Mr. Lindley: That is all, Mr. Chandler.

Testimony of ROBERT CHRISTIAN, who, being called and sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is you full name, Mr. Christian?

A. Robert Christian?
Q. What is your age, and where do you live?
A. I live here in Tonopah.
Q. You live in Tonopah?
A. Yes.
Q. What is your business, miner?
A. Yes.
Q. Were you ever foreman of the operations in the West En claim?
A. Yes.
Q. Were you foreman of the West End Company in its mining operations at the time a vein was discovered?
A. I was.
311 Q. In what shafts was that discovered?
A. McQuillan shaft.
Q. Can you point to it on this model?
A. I don't know anything about that.

Mr. Lindley: Oh, there is no question about the location of that.

Mr. Dickson:

(Q.) Do you remember what depth?
A. Between 390 and 400 feet.
Q. From the collar of the shaft?
A. Yes.
Q. And when was that discovery made, if you know?
A. It was made on the 3rd of April, 1903.

Mr. Lindley: Before final entry in the patent proceeding, it is admitted.
Mr. Dickson: You admit that?
Mr. Lindley: Yes.
Mr. Dickson: That is all I wanted to show.
Mr. Lindley: And furthermore, we admit that it is on the north dipping vein.
Mr. Dickson: That is all. We offer in evidence, in connection with the testimony of the witness, the patent for the West End Mining claim.
The Court: It will be known as Defendant's Exhibit I.

Cross-examination:

Mr. Lindley: I would like to examine the witness as to the character of this discovery.
Mr. Dickson: I was just going to ask him myself. Go
312 ahead, though.

Mr. Lindley:

(Q.) Describe the character of this discovery when you first encountered the vein in the McQuillan shaft? What kind of a vein was it?
A. It was quartz.
Q. The shaft went through it?

A. Shaft went through it.
Q. What was the width of it?
A. I think it was about 40 feet; 40 or 43 feet.
Q. What did it look like?
A. It was oxidized; oxidized quartz; I saved some. Hard quartz.
Q. At the time you encountered it, did you start a station, start to run drifts from that point, or continue the shaft on down?
A. No, coninued on down.
Q. How long before you came back to it to run the levels out?
A. Well, I can't be sure of the time; probably over a year.

Mr. Lindley: Some questions suggested to Mr. Christian which may not be proper cross examination. We may recall him a little later on another branch of the matter. I do not want to discuss matters that may not be proper cross-examination. The object of this witness was simply to show the date of the discovery?
Mr. Dickson: Yes, the fact of the discovery and the date.
Mr. Lindley: Of course, the cross examination suggested goes beyond that and I will not press it at this time.
Mr. Dickson: I would like to ask one question.

313 Redirect examination.

Mr. Dickson:

(Q.) Where you encountered the vein first——
A. What?
Q. Where the shaft first cut the vein, did the vein carry any values?
A. Yes.
Q. Do you know how much?
A. $7 is the highest assay I got.

314 Redirect examination.

Mr. Dickson:

Q. Where the fault cuts the vein did the vein carry any values?
A. Yes.
Q. Do you know how much?
A. Seven dollars was the highest assay that I got.
Q. Seven dollars?
A. Yes.

Mr. Dickson: That is all.
Mr. Lindley: I may ask the privilege of recalling Mr. Christian later. I have not inquired into this matter and if we desire you to return Mr. Christian, we will send for you.

Witness excused.

Mr. Dickson: The patent was received and marked, Mr. Clerk?
The Court: Yes, defendant's Exhibit—I.
Mr. Lindley: The title is admitted in the pleadings.

Testimony of H. R. BRADLEY, called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

Q. What is your name?
A. Harry R. Bradley.
Q. What is your age?
A. Twenty-nine.
Q. Where do you live?
A. Tonopah.
315 Q. What is your business.
A. Practical miner.
Q. How long have you been engaged in working as a miner?
A. For a period covering more than eleven years.
Q. In any of the mining Camps of Nevada?
A. I have worked in several of the Camps of Nevada.
Q. Have you worked in Tonopah?
A. I have.
Q. Were you ever in the employ of the West End Mining Company, as a miner?
A. I was not.
Q. Have you been employed by the West End mining company recently to make some examination of underground workings in the West End claim?
A. I have.
Q. And how long have you been engaged in that work?
A. Why, a little more than a month.
Q. You made a pretty thorough and careful examination of the underground workings generally?
A. Of the disputed territory I have.
Q. I do not want to prolong the testimony any longer than I have to. I understand that this witness is quite familiar with the underground workings. All I care about is to call his attention to these raises and what he found in the stopes beneath. I will ask you if you are familiar with this model Mr. Bradley?
A. Yes, I am.
Q. Well, take the raises coming up from the north dipping vein first. I will ask you if you have been up 488 raise?
A. I have.
Q. Describe what you found in it?
A. 488 raise is a raise driven in what I call the north vein quartz, following the hanging wall of the north vein up for a distance
316 of sixty feet. The hanging wall is easily traced through the entire course of the vein, and the quartz is of varying width, from three feet to about one and one half feet in the face.
Q. And from its appearance what is the quattz there in that raise, what is the vein matter in that raise, compared with the quartz and vein matter in the north dipping stopes, as you call it.
Q. The character of the quartz is the same. It is a north dipping

quartz and there is no difference in the appearance so far as I was able to see.

Q. And the quartz that you find in the raise in your judgment and opinion, was that quartz in place, or was it what you call drag?

A. It was quartz in place.

Q. You know what is meant by drag ore or drag quartz?

A. I do.

Q. Now take the next raise west of that? What is it?

A. 461.

Q. Were you up there?

A. I was.

Q. And you may state what you encountered in that from the top to the bottom?

A. The raise is approximately thirty-seven feet long, and it starts out of 461 drift, a hanging wall drift on the north vein, following the hanging wall on the north vein on the 496 to the intersection with the 411 East Drift.

Q. The raise goes up from that level?

A. The raise goes up from that level. It is in quartz all the way up and the hanging wall is disclosed throughout the entire distance; there are values in that raise.

Q. In your opinion as a miner does the material in that
317 raise anywhere disclose values observable by the eye, an ocular examination, without the test of acid.

A. There is 13 ft. up the raise.

Q. Go to 2-A please.

A. 2-A is a raise 120 feet in length.

Q. It starts in a stope or from a stope?

A. Yes, it starts from a stope and continues up over the hanging wall of what is called the south dipping vein; all in continuous quartz for a distance of eighty-five feet. There is also good ore in this raise in places, two places that I remember, one 45 feet up the raise, and the other 59 feet.

Q. Carrying values observable to the eye?

A. Remarkably observable.

Q. Now, what is this structure or dip of the quartz in the bottom of the raise, in the stope?

A. Well, of course, it has been stoped out at that point, but where it is observable in the raise it has a north dip.

Q. Any quartz remaining in the stope itself?

A. There is quartz on the other side of the stope.

Q. What is its dip?

A. North.

Q. Go to 4-A?

A. 4-A is a raise 63 feet in length; it is also driven in continuous quartz with no interruption and the hanging wall plainly visible throughout the raise. More than a foot of quartz in the face of the raise.

Q. And what is the greatest thickness of quartz that you have in that raise?

A. 4½ feet is the greatest thickness that I encountered.

Q. And does that disclose any values to the eyes?
A. It does in two places.
Q. Go to the next one—5-A.
A. 5-A is a raise also following the hanging wall, and the
318 quartz in the north vein, driven for a distance of 137 feet, which shows continuous quartz for a width of from two to five and one half feet.
Q. How far up?
A. For a distance of seventy-five feet, where it is cut off by a porphyry wall; the balance of the raise is porphyry.
Q. You do not make any distinction between the trachyte and the rhyolite; call them all porphyry.
A. Porphyry is good enough for me.
Q. 6-A?
A. 6-A is also a raise on the north vein and has a height of approximately 23 feet. The same conditions obtain in this 6-A as in 5-A, 4-A and 2-A.
Q. Quartz all the way up?
A. Quartz all the way up.
Q. 7-A?
A. 7-A is also a raise driven on a continuance of the north vein; it is very misleading,—the quartz varies. In some places it is hardly trac-able at all; approximately fourteen feet from the end of the raise I saw no quartz at all.
Q. From there on down to the bottom have you more or less quartz?
A. Yes, more or less quartz although it is interrupted. It is hard to determine it; it is not as continuous.
Q. Interrupted by what?
A. By slips and breaks and things that I don't know anything about.
Q. A north dip?
A. What there is has a north dip.
Q. Where that quartz is found there is it in place?
A. It is in place, yes, sir.
Q. And has a northerly dip?
A. It has a northerly dip.
Q. Were you in 366.
A. I have been in 366, although I have never been able to get into it from below; it is caved.
Q. You have never been up this little raise 3-B?
A. Yes, I have been up that raise.
319 Q. Been up the line connecting——
A. Yes, I have.
Q. And in 366-raise, the one there in yellow on the model, state to the court what you find there, as to dip and material.
A. I find a north dipping quartz following up to cap rock; it is cut off in its rise against the cap, and it is the same character as this quartz back here, being what is called the north dipping vein.
Q. What are you pointing to?
A. Back here on the north dipping vein.

1893

Q. You are back to the stopes?
A. Yes.
Q. Now did you observe this little piece of work that I now point to with my finger, colored in yellow and extended in red up to 466 raise?
A. Yes, I did.
Q. Is that run on the hanging wall, or is it simply a piece of work in the north dipping vein?
A. Well, it is a continuation of a raise—302 raise, from a drift on the south vein; showing south dipping quartz, and the raise shows the porphyry hanging wall for thirty feet, it is concealed by a scab of quartz, and is then exposed forty feet up the raise by a shaft, vertical raise exposing the porphyry hanging wall again. The porphyry hanging wall terminates against the north dipping quartz.
Q. About where?
A. About eighty or eighty-two feet up the raise.
Q. How do you get from there to 366 raise?
A. The raise straightens up into an abrupt incline, and holes into this 366 raise.
Q. Now, coming to the A-raise?
A. The hanging wall of the north vein is exposed at the end of this 302 raise.

Mr. Lindley: Your question was as to the A-raise.
320 Mr. Dickson: I know. I was just letting him finish his answer.

Q. Is that all you desire to say about that 366 raise?
A. That is all, yes.
Q. Did you find quartz in that?
A. Yes.
Q. North dipping quartz?
A. Yes, I did.
Q. Does that appear to be in place or drag?
A. It is in place, a large body in place.
Q. Now, going to the A-raise,—you have been up that I take it?
A. I have, yes.
Q. What did you encounter in that raise,—what kind of material is found in it?
A. Why you find a strong vein of quartz, not so much at the commencement of the raise, but obtaining an average width of three feet throughout the rest of the raise.
Q. How is it at the top?
A. It is two feet at the top.
Q. Quartz still in the top?
A. Quartz still in the top.
Q. What is the dip of that quartz?
A. North dipping quartz following the north dipping hanging wall from the McNamara stope up through the A-raise.
Q. Calling your attention to this portion of the model, I will call your attention — this little connection to the main model lying

east of the east end line of the West End claim, have you been out there?

A. No, I have not this is as far as I have been out here, near the Mizpah raise.

Q. Have you traced out any of these raises, in the south dipping vein?

A. All of them.

Q. Take the most easterly one, and describe what you find there as you go up, and describe what you find at the top of the
321 raise in the way of any difference in structure, if there be any?

A. 569 raise, is a raise driven up from 500-C stope.

Q. This is in what vein?

A. In the south dipping vein, following the south dipping vein up until it is cut off by a north dipping wall.

Q. And the north dipping wall—anything besides a wall?

A. Yes, there is a south dipping quartz on the south side, and a north dipping quartz on the north side.

Q. And the two come together?

A. And the two come together.

Q. The next raise in the south dipping vein westerly of the one that you have just described?

A. 571 raise is practically the same as 569, in as much as the wall cuts off—that wall ends the south vein.

Q. And the dip—is there quartz in that raise?

A. There is quartz all the way up and the porphyry hanging wall is exposed all the way, for 35 ft.

Q. And whereabouts as you follow up that raise do you encounter quartz of a northerly dip?

A. Fifty one feet up that raise; this line is the end of the south vein, and is the foot wall of the north vein. The quartz on the south vein having a south dip, and the quartz on the north vein having a northerly dip.

Q. Did you observe the angle of dip on the two walls there; did you observe it with your eye?

A. I did.

Q. Have you a recollection now of what angle of dip of the south dipping quartz is?

A. What the angle of the dip of the quartz is?

Q. Yes.

A. I should say about thirty five or thirty eight degrees.

322 Q. What would you say of the dip at the point of junction of the north dipping quartz?

A. I should say that dipped about forty one degrees.

Q. Go to the next one?

A. The next one is 573-raise. At the start of that raise you have a south vein hanging wall, a hard porphyry hanging wall, traceable continuously through 573 raise to its intersection with 411 E. D. drift, also along the intermediate connecting 573 raise and 575 raise; the intermediate is 65 feet long, and the hanging wall is exposed throughout.

Q. And the dip of those two raises, the intermediate is what,—the dip of the quartz?

A. I don't know what the dip of the quartz——

Q. I mean the direction?

A. The dip of the hanging wall is 45 degrees; the quartz has a south dip.

Q. And does either of these raises come in contact anywhere or the intermediate drift which you refer to, come in contact with the northerly dipping vein?

A. Yes, at 573 raise; the lower part of the south dipping quartz in 573 raise is cut off against a porphyry wall; that wall is six feet high. The upper part of the quartz continues on up to the intersection with 461 hanging wall drift; the quartz there is not cut off by the porphyry wall. The south dipping quartz terminates against the north dipping quartz; the line of demarcation is very plain.

Q. A change in the dip?

A. Yes, a change in the dip.

The Court:

Q. Is it a distinct line of demarcation there?

A. There is a distinct change in dip. The quartz coming up that way having a southerly dip and meets the quartz this way having a northerly dip; in that way you can see the change in
323 the dip. It is not gradual it is very abrupt.

Mr. Dickson:

Q. Go to the next. The other raise from the south dipping vein, if you follow it up to a junction with what you call the north dipping vein?

A. No, 575 raise, but it does go over to the south dipping vein; it is an old raise.

Q. Have you taken any samples of rock from any of these raises and delivered them to an assayer?

A. I have, taken several samples.

Q. Have you a list of them?

A. I have.

Q. Has anybody taken samples in connection with you?

A. There was. Mr. Hoxie also took samples.

Q. You and Mr. Hoxie took samples together?

A. Yes.

Q. Have you the result of your samples here?

A. I have.

Q. I will ask you how you took your samples?

A. We took the samples across whatever looked to us to be ore.

Q. You took samples of what appeared to you to be vein material?

A. Yes.

Q. What did you do with the samples?

A. We delivered them to the assayer.

Q. Carried them down in your hands?

A. Yes, carried them down in our hands.

Q. Did you have them designated with numbers?
A. There was a number in the sack, but he could not tell from what part they came.
Q. Each sample was delivered in a sack by itself, one sample in a sack?
A. One sample in a sack.
Q. And a number with each sample in the sack?
324 A. A number accompanied each sample in the sack.

Mr. Dickson: It is now half past four, so I presume that we had better adjourn.
Mr. Lindley: I would like to say before the adjournment is taken, that there is an understanding between counsel that at some stage during this case that the court is to be invited to accompany a representative of each side to the underground workings of the mine. Would that be agreeable to the court?
The Court: Yes, certainly.
Mr. Dickson: A representative I suppose, you mean one of the experts, Mr. Lindley?
Mr. Lindley: Yes, one of the experts. We will keep the lawyers out of this part of it.

(At this time an adjournment was taken until tomorrow morning at Ten o'clock A. M., December 11, 1914.)

325 7.

December 11th, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

H. R. BRADLEY, on the stand for further direct examination.

Mr. Dickson:

Q. Mr. Bradley, have you a list of the samples that you took in connection with Mr. Hoxie?
A. I have.
Q. Will you hand them to me please?

(Witness producing list.)

Q. The samples which you took you and Mr. Hoxie, and which you delivered to the assayer, I understand were all taken from one or the other of these regions?
A. They were.
Q. What date or dates were your samples taken.
A. December third and fourth.
Q. Can you identify the place from which each of those samples were taken?
A. I can.
Q. The list that you hand me is dated December 4, 1914, are all the samples that you took on this list?

A. They are; they are all in one list; that list was made at the office a copy of the original list.
Q. And where was your sample No. 1 taken?
A. Sample No. 1 was taken in 2-A raise.
Q. Do you know at about what point in 2-A raise?
A. Yes; it was about forty five feet up the raise.
Q. Did you make a memorandum of the width of the material that you sampled there?
A. It was approximately one foot.
326 Q. You did make a note of it?
A. I did.
Q. Where was your sample No. 2 taken?
A. Also in 2-A raise.
Q. And about at what point?
A. About 59 feet up the *faise*.
Q. And what was the width of the material that you there sampled?
A. About 14 inches.
Q. Did you take a sample in this and the preceeding instances across the entire width that was sampled?
A. Yes, just across that width.
Q. In other words you did not sample the width of the raise but sampled the entire width of the material of which you took the sample?
A. Yes, sir.
Q. Where was your sample No. 3 taken?
A. It was taken in 4-A raise.
Q. And from where if you know?
A. Well, I would have to look at that sheet.

Mr. Lindley: Well, just put the sheet in evidence Judge; if it states where it was taken and identify the number of samples. If it will shorten the thing in any way.
Mr. Dickson: It won't take much time. The sheet will not show the point in the raise where they were taken.
Mr. Lindley: Oh, I beg your pardon I thought he had to refer to the sheet to find out where they were taken.

Mr. Dickson:

Q. That was taken where, in 4-A raise?
A. About 18 feet up the raise.
Q. What was the width of the material there sampled?
A. About one foot.
Q. And No. 4 was taken where?
A. Also in four-A raise.
Q. Whereabouts in the raise?
A. Up about 34 feet in the raise.
Q. What was the width of the material that you sampled there?
327 A. That was about two feet.
Q. Where was sample No. 5 taken?
A. No. 5 sample was taken in 5-A raise.

Q. How far up?
A. 70 feet in the raise.
Q. What was the width of the material that you sampled there?
A. About eight inches.
Q. Where was sample No. 6 taken?
A. 461 raise.
Q. How far up?
A. 13 feet up in the raise.
Q. What was the width of the material sampled there?
A. It was about 10 inches.
Q. Where was your sample No. 7 taken?
A. 429 raise.
Q. Just point that out on the model?
A. (Indicating.) Right there.
Q. That is in the south dipping vein I take it?
A. In the south dipping vein.
Q. What was the width of the material sampled there?
A. Twenty inches.
Q. Where was sample No. 8 taken?
A. Also in 429 raise.
Q. At what point?
A. The 45 foot mark.
Q. That is forty five feet up the raise?
A. Forty five feet from the bottom of the raise.
Q. What was the width of material sampled?
A. About two feet.
Q. Where was sample No. 9 taken?
A. Taken in 537 intermediate.
Q. Just point to that?
A. It is out of 569 raise.
Q. What do you mean by intermediate?
A. An intermediate is development work from a raise or a stope.
Q. From what point to what point?
A. Why, it is done—it runs from 537 raise to 569 raise.
Q. Is that shown on the model?
A. It is.

328 Q. Point out about where this sample was taken No. 9?
A. That was taken about ten feet—I withdraw that—I will have to think a moment just where that was taken. That was taken approximately 70 feet from its intersection with 569 raise, just about that point there (indicating).
Q. Where was sample No. 10 taken?
A. It was taken in 571 winze, in the bottom.
Q. Where is that?
A. That is a winze driven from the foot wall of 571 raise.
Q. Foot wall of what?
A. 571 raise, the south vein.
Q. Where was the sample taken, in the north vein?
A. In the north vein, yes.
Q. And about what point was that?
A. It was taken ten feet from the end of the winze.

Q. Where was sample No. 11 taken?
A. That was taken also from 571 raise.
Q. Whereabouts?
A. Five feet from the face of the winze. I will have to make an explanation. The sample previous to this one was 571, was taken ten feet from the beginning of the winze, not from the end of the winze.
Q. No. 11 was taken where?
A. Five feet from the end of the winze in the top.
329 Q. Where was your sample No. 12 taken?
A. In 573 winze; the winze leading from the foot wall of 575 raise.
Q. And your sample No. 13?
A. Was taken from 302 raise; raise leading from 302 east drift.
Q. In what vein, the south dipping or the north dipping vein?
A. In the south dipping vein.
Q. Now, were those all the samples which you took and Mr. Hoxey?
A. Those were all the samples that we took.
Q. Did you take any from the No. 6 raise?
A. We did not.
Q. From the No. 7 raise?
A. No.
Q. 7 A raise, I should say, or 6 A raise?
A. No.
Q. Did you take any from the A raise?
A. No, we did not.

Mr. Dickson: I was in error, Mr. Lindley, when I answered your suggestion. I find that this sheet which the witness was handing me does indicate, in each instance, the width, and does indicate approximately in every*t* case quite definitely the point from which it was taken.

Q. Is the paper which you have handed me, Mr. Bradley, is that correct?
A. It is correct.
Q. Is the statement as to the width of the material?
A. It is correct.
Q. And the place from which each sample was taken?
A. It is.
Q. I see a note at the bottom here that samples 1 to 12 inclusive taken December the 3rd, and No. 13 taken December the 4th, is that correct?
330 A. That is correct.

Mr. Dickson: I ask to have this marked as an exhibit. We offer it.
Mr. Lindley: Let it be included in the reporter's notes.
Mr. Dickson: Very well.
The same was marked Exhibit "K" and was and is in the words and figures following, to wit:

The West End Consolidated Mining Company.

Daily Assay Report.

Litigation.

TONOPAH, NEVADA, Dec. 4, 1914.

Sample No.	Working place.	Width.	Gold. Ounces.	Gold. Val.	Silver. Ounces.	Silver. Val.	Total value.	Remarks.
1.	2-A Raise	1-ft.	18	3.60	21.16	10.58	14.18	Up 45 ft. in Raise.
2.	2-A Raise.....	14-in.	24	4.80	25.58	12.79	17.59	Up 59 ft. in Raise.
3.	4-A Raise	1-ft.	76	15.20	84.32	42.16	57.36	Up 18 ft. " "
4.	4-A Raise	2-ft.	20	4.00	23.30	11.65	15.65	Up 34 ft. " "
5.	5-A Raise	8-in.	12	2.40	17.15	8.58	10.98	Up 70 ft. " "
6.	461 Raise	10-in.	10	2.00	9.08	4.54	6.54	Up 13 ft. " "
7.	429 R @ 40 mark.	20-in.	36	7.20	40.42	20.21	27.41	Across Bottom & side.
8.	429 R @ 45 " .	2-ft.	36	7.20	37.04	18.52	25.72	Across top & Side.
9.	537 inter.....	1-ft.	16	3.20	17.50	8.75	11.95	70 ft. from 569 R.
10.	571 W. in bottom.	2-ft.	76	15.20	75.22	37.61	52.81	10 ft. " end S. Vn.
11.	571 W. side & top.	2-ft.	1.18	23.60	157.34	78.67	102.27	5 ft. from face of winze.
12.	573 W.....	18-in.	1.40	28.00	125.38	62.69	90.69	25 ft. from 573 R.
13.	302 Raise	2-ft.	24	4.80	25.08	12.54	17.34	Up 12' from 302 drift.

Samples 1 & 2 inclusive taken December 3rd; No. 13 taken Dec. 4th.

332 The Court: Let it be known as Defendant's Exhibit K.

Mr. Dickson:

(Q.) I think you stated yesterday, Mr. Bradley, that each sample was put in a sack by itself and with a number. Does the number of the sack correspond with the number of the sample contained in it?

A. It did.

Q. And I will ask you if each—withdraw that. Were these samples, any of them taken from rock which was not in place?

A. They were not.

Q. And what did you do with the samples after you put them in the sack with the number?

A. We kept them right with us and delivered them personally to the assayer.

Q. What was his name?

A. I don't know what his name is.

Q. Do you know whether he is an assayer for the West End Company or not?

A. He is.

Q. You do not know his name.

A. I don't know his name.

Q. You would know him when you see him, if he should come here?

A. Yes.

Q. I think you stated, Mr. Bradley, that you had spent about a month in the examination of the underground workings in these properties?

A. I did.

Q. Did you go through the works, all of the workings that were open and accessible?

A. Not all, no.

Q. Most of them?

A. No, not most of them. Just the works that had any relation to the veins in dispute at their top or apex.

333 Q. Did you follow down the south dipping vein from its juncture with the north dipping vein?

A. I did.

Q. How far down did you go?

A. Down to the 600 level, as far as I could get.

Q. At which end, or both? West end or east end?

A. On the east end of the claim, down to the 600, and on the west end of the claim down to the 500.

Q. And on the north dipping vein, how far did you follow that down at the west end—westerly end?

A. I followed it every place that I could in the West End ground, and some places in the MacNamara.

Q. Following it down from that A raise through the stopes?

—. Down from the A raise, yes.

Q. Have you, while you have been engaged in mining, have you ever occupied any other position than that of a miner?

A. Yes, I have occupied several positions in and around mines.

Q. What positions have you occupied?
A. That of foreman and shift boss.
Q. You never worked in either the MacNamara or West End?
A. Not as a miner, no.
Q. As a miner, what is your opinion, if you have one, as to what kind of a vein this south dipping vein is?
A. I would call the south dipping vein a fissure vein.
Q. And what would you call the north dipping vein?
A. I would call the north dipping vein a fissure vein also.
Q. Have you in the east end or the west end workings on the south dipping vein followed up to the junction of the two
334 veins?
A. I have.
Q. And what, in the way of fissure, did you follow up from level to level? I do not care for a description of it, but did you or did you not follow up a fissure?
A. I did; I followed up the south fissure to its intersection with the north fissure; and also followed up the north fissure to its intersection with the south fissure.
Q. From what you have observed in this month that you have been engaged in examining the undergrounds workings, have you formed an opinion as to what you, as a miner, would take as the top of the south dipping vein?
A. I have.
Q. Where do you say the top is?
A. I say that the top of the south dipping vein ends against the foot wall of the north vein.
Q. In what respects, if at all, do these two fissure veins which you have mentioned differ, the one from the other?
A. So far as I can see, they differ only in one respect, and that is—or I should say, that they are similar only in one respect, and that is in the quartz; both veins carrying practically the same kind of quartz, so far as I have been able to judge.
Q. In what respect do they differ, then?
A. They differ in their size, differ in their dip, differ in their strike, differ in their hanging wall, in the appearance of the hanging wall.
Q. You say they differ in size.
A. They do.
Q. Is that true, speaking generally, of the——
A. So far as I have observed, it is.
335 Q. As you went down from A raise, from its top down into the stopes of the MacNamara as far down as you did follow in that direction, state whether or no the hanging wall of the north dipping vein is observable, to be seen?
A. It is.
Q. And what is its appearance, the hanging wall of the north dipping vein?
A. Well, wherever it was not caved off, it is what we call a gouge hanging wall, clay seam along the hanging wall.

Q. Is that true as you go up the A raise, as well as up through the stopes?

A. It is.

Q. Is that true at the place where the south dipping vein intersects or comes in contact with the north dipping vein?

A. It is, as shown in A raise, and a place in the stope about 10 feet long, 15 feet east of A raise.

Q. Now, could that be observed by anybody who should go there to-day?

A. It can.

Q. The hanging wall of the north vein in that immediate vicinity having the clay gouge?

A. It can.

Q. And what is the appearance of the hanging wall of the south vein in the immediate vicinity of the mine at the juncture, if it be observable there?

A. It is a very hard porphyry hanging wall where it is exposed. However, part of it is concealed by quartz; in that kind of a hanging wall you have to break the hanging wall down with the quartz, you can not draw the line between the two when you are stopeing.

Q. What do you mean, you have to break the hanging wall with the quartz, is it frozen?

336 A. It is frozen to the hanging wall, yes.

Q. On the hanging wall of the south dipping vein?

A. On the south dipping vein.

Q. Can that be observed by anybody who should go there to-day?

A. It can.

Mr. Dickson: You may cross examine.

Cross-examination.

Mr. Lindley:

(Q.) How long have you been engaged in mining in Tonopah?

A. About ten months.

Q. That is including the period that you have been engaged in investigation in the West End?

A. It does.

Q. Where did you work, what other mines?

A. In the North Star Mine.

Q. Any other mine?

A. No other mine.

Q. Are the conditions in the North Star Mine anything similar to what you have here in the West End and the MacNamara?

A. No, I do not recall any two vein- meeting in the North Star.

337 Q. Well, as to the veins themselves?

A. Yes, they are all fissure veins in the North Star.

Q. Do they lie the same as these do, in the same rocks.

A. They do, only at greater depth.

Q. These are the only mines that you have worked in in Tonopah the North Star and what you have done in the West End?

A. Those are the only ones.

Q. What position did you occupy in the North Star?

A. That of shift boss.

Q. Where had you worked before you came to Tonopah?

A. I worked in Montana, Wyoming, Idaho and Utah, and different camps throughout Nevada.

Q. Were you working at the North Star at the time that you were employed by the West End Company?

A. I was.

Q. What was the task assigned to you when you were employed by the West End company?

A. To make a study of the physical facts underground.

Q. Well, I understand you to say that you have not seen all of the workings on these veins in the McNamara and West End ground?

A. Just the physical facts that related to this dispute.

Q. Well, you thought that all that was necessary was to examine the ground in the immediate neighborhood of the so-called juncture of the vein?

A. I did.

Q. And you limited your examination to that?

A. To those points, I did.

Q. You are not familiar with the major part of the workings in the entire mine.

A. I am not.

Q. Now with reference to these samples, you say that you sampled here a bit and there a few inches, and there some more of an

338 area?

A. Yes.

Q. Is that the ordinary way of sampling an upraise or drift or winze?

A. No it is not the ordinary way. Our idea was to determine whether or not there was paying values in that raise.

Q. You simply took the quartz?

A. That is all.

Q. You did not take any gangue, or anything that the miner would in the ordinary stoping of the vein?

A. We did not.

Q. Simply selected samples?

A. Simply selected samples.

Q. Of ore, quartz ore.

A. Quartz ore.

Q. Is there anything else besides quartz that you sampled?

A. There was not.

Q. Then you simply picked out here and there, not for the purpose of determining whether the body or the whole would pay, but as to whether there was pay values in spots?

A. That was the idea.

Q. There is not any difference between the quartz taken at the one south dipping side of this vein and the north dipping side of this vein?

A. Not as a whole.

Q. The quartz in this district is pretty much the same wherever you find it, isn't it?

A. Practically the same, yes sir.

Q. So you could not state if I should hand you a piece of quartz—you could not state where it came from in the camp?

A. I could not.

Q. Now, when you speak of the quartz dipping, what do you mean by quartz dipping; does the quartz dip?

A. I mean the structure of the quartz what you might call the grain of the quartz.

Q. You mean to infer from the dip of the quartz that that is the dip of the vein?

A. Well, in this case it does. The quartz in the vein dips
339 the same as the hanging wall,—parallel to the hanging wall.

Q. Well in determining the dip of a vein, you take the wall don't you?

A. Oh, yes.

Q. That is the rule?

A. That is the rule.

Q. That is the only way you have to determine the boundary of a vein?

A. Yes.

Q. You say that you have a good hanging wall in what you call this north dipping vein, do you?

A. Have a well defined hanging wall, yes.

Q. It carries gouge does it?

A. It does in every place that I have observed it, except where there is a large area—where there has a large area been stoped; in a case of that kind of course the gouge would be caved off from the wall, as it is not self supporting.

Q. In other words in mining in a drift where you have a cleavage between your ore and your wall, your ore has dropped easily, without having to break the wall?

A. It has.

Q. And where your ore is frozen to the country rock, the country rock comes down with the quartz or ore?

A. More or less of the country rock.

Q. And in that case you have no definite hanging wall, except the line of demarcation or country rock?

A. That is what I have always called the hanging wall in any country.

Q. Well, you mean by hanging wall the overlying wall, whether a selvage or clay seam or country rock; that is the hanging wall?

—. ——.

Q. That is the hanging wall?

A. Yes that is the hanging wall.

Q. Now, did you desire us to infer from your testimony that the north dipping vein has a well defined parting, a gouge hanging wall, and that the south dipping vein goes into the country rock.

340

A. Wherever I have observed it it has.

Q. There is no gouge on the hanging wall?

A. On which vein?

Q. The south dipping vein?

A. Well, I recall one place where I saw some little gouge on the hanging wall of the south dipping vein, different, however, in character from that on the north dipping vein.

Q. How about this place up in the neighborhood of Raise-A; the miner has evidently mined that as one stope, didn't he, up on the north dipping vein and down on the south dipping vein; take it to the westerly stope.

A. Well, there is some of this ore that evidently did not pay so it is in there yet.

Q. Well, I mean that that was taken out; west of the A-Raise.

A. West of the A-Raise?

Q. Yes. That evidently,—did you observe the walls in the immediate vicinity, the crest or top there?

A. I did.

Q. In both the north and south?

A. I did.

Q. You say that on the south dipping vein there is a gouge? And on the north dipping vein at that point is it frozen?

A. No. Just the reverse to that.

Q. But there is a gouge from above here?

A. There is a gouge from the north dipping wall, and frozen quartz on the south dipping wall.

Q. In other words you pass by a definite line of overlying hanging wall into gouge to the north dipping vein in a zone that has no frozen country rock?

A. Wherever the hanging wall is broken, you do.

Q. Well, what do you mean by that?

341

A. Well, evidently when they mined this, when they took out this ore, they didn't try to find out just what was their true hanging wall; in other words, put up a row of holes to break that down.

Q. Your idea is that the real hanging wall of the south dipping vein is higher than shown on the model?

A. No, the hanging wall of the north dipping vein is higher.

Q. And the gouge is not exposed in there?

A. It is at A-Raise, and back to a point fifteen feet west of A-Raise where a slab is broken off.

Q. In the extreme west end of that stope there is a wall exposed in the north dipping vein?

A. There is.

Q. What is it?

A. A gouge hanging.

Q. When speaking of west of A-Raise. You are pointing to the east. Have you been talking of the east of the raise?

A. With regard to the hanging wall being broken.

Q. I have been talking of west of the A-Raise. Let us straighten ourselves out. I am speaking about the condition of the stopes west of the A-Raise. Is there any difference in the hanging wall in the south dipping and north dipping vein in that locality?

A. Not that I recall.

Q. Is it a gouge hanging wall?

A. It is a gouge hanging wall.

Q. How is it in the south dipping?

A. It is a hard porphyry hanging wall wherever it is exposed.

Q. In other words there is a difference right at that point between the hanging wall of the two veins?

A. There is further down but right at the point where they intersect is more or less frozen quartz. It has not been stripped off so that you can tell.

Q. To tell whether you have a hanging wall above it or not?

A. You could not.

342 Q. Now in those raises that we call the A-raises down here, in the east section of the country, you say that you have a good hanging wall there?

A. We have.

Q. What does it consist of?

A. Wherever it is caved out it is gouge, or a clay seam.

Q. And if you did not have a gouge you would not have a wall; you would not have a hanging wall there. You consider that if you did not have the gouge there that that would not have a wall?

A. Yes; it is caved there in places; the line of wall is still plain along the side of the raise.

Q. What is the bottom of the upraise in?

A. Porphyry.

Q. In other words you have a foot wall of porphyry?

A. A foot wall of porphyry, yes sir.

Q. Frozen?

A. Yes, frozen,—the quartz is frozen to the porphyry.

Q. Well do you know how far down that quartz extends?

A. Not in every case, no.

Q. In any case?

A. Yes, I do in this vertical raise.

Q. I am speaking about—which vertical raise?

A. That holes into 5-A.

Q. Well, I was not speaking about,—tell us what you found in that vertical raise?

A. Vertical raise holeing into 5-A raise shows 17 ft. of porphyry between the hanging wall, of the south vein, and the foot wall of the north vein, as shown in 5-A raise.

Q. That is between the foot wall of the raise above and the red vein below?

A. Yes. The hanging wall of the red vein below.

Q. You say that foot wall in that raise is frozen?

A. It is in places; in places it has been dug out.

343 Q. Now, I suppose you have studied this model pretty closely, haven't you?

A. I have.

Q. Anybody tell you what the things are that it stood for, and what they meant?

A. Well, they would hardly need to tell me.

Q. Well, answer my question, please.

A. Not that I recall, no.

Q. Haven't had any discussion with Mr. Wiley or Mr. Winchell, or Mr. Chandler about these different exposures in different raises?

A. Why, I have asked what the coloring meant, yes.

Q. And you testify now with the reference to the colorint and your description is taken, is it not, from the coloring on this model?

A. No, my description is taken from the rocks on the ground.

Q. How would you know where they terminated on the model unless it was colored?

A. By scaling it off as to height.

Q. Have you scaled it off since you have been on the stand here?

A. No, not since I have been on the stand.

Q. Then, in connection with your work, you have studied very closely the model, haven't you?

A. I have.

Q. Did I understand you to say you were working for the North Star Company at the time you were employed in this case?

A. I was.

Q. You did not make any of the work in this mine, did you, as a miner?

A. I did not.

344 Q. And you do not know who made them?

A. No, I do not.

Q. You were called, then, as a practical expert rather than as a man who had made the works as a miner?

A. I was.

Q. You knew, I suppose, at the time you came that these upraises had not been made by the miner in the prosecution of the ordinary work in the mine, did you not?

A. I didn't know anything about the condition underground when I was employed by the West End.

Q. Well, I mean after you got in and found out what the condition was. You knew that this was litigation work, didn't you, and not ordinary mining work?

A. Yes.

Mr. Lindley: That is all.

Redirect examination.

Mr. Dickson:

(Q.) I wish that you would indicate a little more definitely, Mr. Bradley, the place where in the MacNamara common stope, near the

West End, where you say that there is ore remaining there which is of too low a grade, apparently, to take out, was not stoped?

A. About 30 or 35 feet east of A raise.

Q. On which, the north dipping or south dipping vein?

A. On both veins.

Mr. Dickson: That is all.

345 Recross-examination.

Mr. Lindley:

(Q.) I would like to ask Mr. Bradley another question or two. Do you determine with reference to this ore that you say is in place, that it did not have values enough to stope, do you determine that fact from the fact that the ore is there, or from looking at the ore?

A. From both.

Q. Do you pretend to say that you can go in that mine and look at a stope and tell whether it will pay without sampling?

A. No, I could not tell whether it would pay or not, but I could see whether there was any considerable amount of sulphides, or what is called rhodonite in it.

Q. Well, the fact is that the ore was there and you concluded from that, from the stopes in that immediate vicinity that they did not stope out because it did not pay?

A. That was my conclusion.

Mr. Lindley: That is what I though-. That is all.

Mr. Dickson: That is all; call Mr. Hoxey.

Testimony of BEN. I. HOXEY, who, being called and duly sworn as a witness on behalf of the Defendant, testified as follows, to wit:

346 Direct examination.

Mr. Dickson:

(Q.) What is your full name, Mr. Hoxey?

A. Ben Irving Hoxey.

Q. What is your age?

A. 42.

Q. Where do you live?

A. I reside in Tonopah at present.

Q. How long have you lived in Tonopah?

A. Why, the better part of eight years.

Q. What is your business?

A. Miner.

Q. How long have you been a miner?

A. Well, I have been for twenty years.

Q. And how long have you worked as a miner in Tonopah?

A. Well, I have been mining here for about a little over seven years.

Q. Have you ever held any position with the mines in Tonopah other than that as a miner?

A. I have.
Q. What position?
A. Well, I was foreman of the MacNamara.
Q. For what mines have you worked chiefly in Tonopah?
A. Well, I have worked in the MacNamara a great deal, and I have worked in the Belmont and the Buckeye, and the West Tonopah.
Q. Were you ever employed as a miner or shift boss or foreman or in any other capacity by the West End Company?
A. Not with the West End Company.
Q. Have you been employed by the West End Company recently?
A. I have.
Q. To do what?
—. To study the physicial facts underground in certain
347 places of the mine in regard to this litigation.
Q. How much time have you spent in that examination?
A. Since the 9th day of November.
Q. Daily?
A. Every day.
Q. You are familiar with this model?
A. T- a greater or less extent, yes.
Q. What is colored in red at the east end of the model, how far, to what depth have you been down there in your examination?
A. On the red color?
Q. Yes?
A. Why, I have been down as far as the 600 level in the West End Claim.
Q. The West End. You mean the west end claim, which do you mean, the 600 level at the east end of the claim, or the west end of the claim?
A. On the east end of the claim.
Q. Been up and down there more than once?
A. I have.
Q. Did you always as you went up and down follow the same line of travel, or have you been up and down from the top or junction to the 600 level in different places in the east end?
A. Well, I have been down there in two ways. That is, two different routes down through the stope.
Q. And at what is colored in red to represent the south dipping vein, near the West end of the claim, for what depth have you been down on that portion?
A. I have been down as low as the 500 level.
Q. That is in the course of your examination?
A. Yes.
Q. A number of times, or once only?
348 A. I was down through that way twice.
Q. Have you worked as foreman of the MacNamara mine for a considerable period?
A. I did.
Q. Were you foreman when the MacNamara Company mined

this portion of the vein which is shown in yellow on this model, most of it?

A. Why, the greater part of it, yes.

Q. How far to the west on what is colored yellow, or what we call the north dipping vein was stoped under your supervision or while you were foreman?

A. Why, there was a little work done, I believe, up in this section, in the extreme western section.

Q. You are pointing westerly of A raise?

A. Yes, sir. There was a little ore extracted there after I had left that company, but this ore here, the most of it was extracted under my immediate supervision.

Q. You say here; what do you mean?

A. In the stope leading in a northerly direction from A raise.

Q. Down how far? As far as shown on the model, or farther?

A. That I extracted?

Q. Extracted while you were foreman?

A. Yes sir, as far down as is shown on this model.

Q. In your examination since the 9th of November, I will ask you if you have made a careful examination of the raises shown upon this model as the 488, 2ZA, 4A, 5A, 6A, 7A, -A and 302?

A. I have.

Q. And 366?

A. I have.

Q. I wish you would start at raise 488, Mr. Hoxey, and tell
349 the Court what you found, what is disclosed in that raise, in the way of quartz or vein material, or walls, or whatever you may have to say about it?

A. Well, 488 is driven upon and follows the hanging wall of a north dipping vein. The vein in 488 varies in size. Now, where the raise commences in 411 East drift the vein — quite extensive there. In fact, there is vein in both sides of the raise, and vein on the top of the raise and vein the bottom. As you continue up on the dip of the vein, the vein gets somewhat smaller, although it continues through to the face of the raise.

Q. On the floor of the raise or at the roof of the raise?

A. No, not on the floor of the raise and not in the roof, but at a point midway between the two.

Q. Now, what have you there at the top of the raise?

A. The top of the raise?

Q. Yes?

A. Well, you have the vein in place. You have wall rock under the vein, and you have wall rock over the vein in the face of that raise.

Q. What do you call vein, quartz there?

A. Quartz.

Q. And what showing of quartz in there at the top of the raise?

A. Why, the showing of quartz at the top of that raise is very weak; in fact, is a very few inches, probably not over three or four inches of quartz in the immediate face of the raise.

Q. And does it gradually increase in width and thickness from there on down to the bottom?

A. It does.

Q. Is that quartz which you find there, in your judgment, in place, or has it been dragged there from some other source?

350 A. No sir, in my judgment it is vein in place.

Q. Go to——

A. That is 461 raise, that one that you indicate.

Q. 461; were you up that?

A. I was.

Q. State what you find there?

A. 461 raise is driven on and follows the hanging wall throughout.

Q. Hanging wall of what?

A. A north dipping vein. The quartz showing on 461 is very strong for nearly the entire distance.

Q. What do you mean by very strong?

A. That is, there is a continual vein of quartz.

Q. How thick?

A. Well, it will vary probably from 2 to 3 feet.

Q. And what have you in the top of the raise?

A. In the top of the raise immediately under the hanging wall of the raise, why, nearly all the formation is porphyry with a mixture of quartz.

Q. You *made* go to 2 A raise and described what you observed in that?

A. 2 A raise is driven from an old stope in a southerly direction. It is driven——

Q. You mean the stope is in a southerly direction? No, you are right. Go ahead.

A. The raise is driven on and follows the hanging wall throughout of a north dipping vein. The raise is of a length of about 137 feet. No, about 120 feet, that raise.

Q. Did you measure it?

A. Why, yes, I measured it. And those distances, of

351 course, I have them in my notes; sometimes they are confusing.

Q. You have your notes with you?

A. Yes sir; if I remember rightly, that is about 120 feet.

Q. And what is disclosed in that raise?

A. Well, that raise shows a quartz vein up the raise continuously for about 75 or 80 feet. The vein, what I say continuously, is that it is a solid continuous vein of quartz up to that distance.

Q. And above that what have you?

A. Above that, although you have the same hanging wall, the showing of quartz is more or less weak. That is, the formation has a greater part of porphyry with a mixture of quartz throughout.

Q. Near the top?

A. Near the top, yes.

Q. And is that also, in your judgment, the quartz that is disclosed there in place?

A. It is in place.

Q. Go to 4 A.

A. 4 A is a raise that is driven from an old stope in a southerly direction. It is driven on and follows the hanging wall for the entire distance of a north dipping vein. This raise shows quartz throughout, clear to the face of the raise.

Q. Clear to the top?

A. Yes, sir.

Q. About what is the dimension, thickness?

A. About—oh, it would vary from a foot and half or two to six feet.

Q. To 6 feet?

A. Yes sir, in places.

Q. Practically the full width of the raise in places?

352 A. Yes, sir.

Q. Is that in place, also, in your judgment?

A. It is.

Q. Go to 5 A.

A. 5 A is a raise that is also driven from an old stope, in fact the same stope.

Q. And the 4 A and the 2 A?

A. As the 4 A and the 2 A. It is driven also in a southerly direction and follows the hanging wall of and on a north dipping vein. This raise shows quartz continuously for about 75 feet.

Q. Then what do you encounter?

A. Why, you encounter a condition where the material immediately under the hanging wall is mostly porphyry, with a small quartz showing in places.

Q. And what are the dimensions of the quartz in that raise up for that 45 feet, if that were the distance?

A. Why, 75 feet, Judge. Pardon me.

Q. What size is the quartz, how thick?

A. Oh, the vein will vary from 2½ to 5 feet.

Q. Go to 6 A?

A. 6 A is a raise driven from an old stope, in fact the same stope that 2 A, 4 A, 5 A, is driven from, and it is driven upon and follows the north dipping vein the entire distance. It is rather a short raise, being only about 23 feet in length.

Q. And what have you in the top of it?

A. Why, this raise shows quartz the entire length of the raise.

Q. Go to 7 A?

A. 7 A is a raise driven from the upper end of the same stope from which these other raises have been driven, and it is—the

353 length of this raise is about 34 feet, and it is driven upon a hanging wall and follows a north dipping vein for the entire length of the raise.

Q. What do you find in it?

A. In 7 A the quartz showing is considerably weaker than in the others. In fact, after you get up the raise, say, oh, probably 12 or 15 feet the showing of quartz is very weak from there in the face. While you can find little bunches of quartz throughout the length

of the raise, why, the formation of that part that should be the vein is mostly porphyry. There is more or less faulting has occurred at the commencement of this raise, and the showing up there is pretty weak.

Q. Now, take 366 raise. Is any portion of that in a vein?

A. A vein?

Q. Any portion of that raise?

A. Why, 366 raise, what I seen of 366 raise was in a vein. The raise is caved at the bottom and you could not get up the raise, so the way I got into the raise was to go up 302 raise which holes through into the bottom of 366 raise, up 366 raise probably half way up the raise.

Q. And when you got into the 366 raise by that route, what was observable there?

A. Why, there was—the raise is all in quartz except that portion which shows the hanging wall over head.

Q. For some distance from the top where it connects with the 200 level?

A. Well, way up near the top of the raise, why, the vein disappears and is replaced by country rock.

Q. Go to A raise. Were you up that?

354 A. I was.

Q. State what you observed there?

A. A raise in the western part of the MacNamara Mine is driven upward in a southerly direction from the top of an old stope. This raise is driven up about 45 feet on a north dipping vein, following the hanging wall the entire distance.

Q. What is observable in it, apart from the hanging wall? What is the material in that raise?

A. The raise follows a vein nearly the entire distance, or—well, the entire distance I would say. It is a very strong quartz showing, nearly the entire length of the raise. The quartz showing right in the top of the raise being a little weak.

Q. And does it or not increase in thickness or width as you go down from the top to the bottom of the raise?

A. Yes, the vein increases in size as you go from the top to the bottom.

Q. Did you, in company with Mr. Bradley, who was just upon the stand, take any samples?

A. Yes sir.

Q. Did you take any from the A raise?

A. No sir.

Q. Why not?

A. Why, I suppose for the same reason that we did not—in other parts, that we did not see anything there that we considered worth while sampling.

Q. Do you think it was barren quartz?

A. Well, no, I don't think it was barren quartz?

Q. Did you think it was low grade quartz?

A. Yes, I did think it was low grade quartz.

Q. What kind of samples were you endeavoring to get as you——

A. Why, we were just endeavoring to procure samples
355 that would show value.

Q. What do you mean by values?

A. Commercial values.

Q. Commercial values?

A. Yes sir.

Q. And did you take any samples, either by yourself or in connection with Mr. Bradley from the 7 A raise?

A. I did not.

356 Q. Was your failure to do so due to the explanation which you have given with reference to A-raise?

A. It was.

Q. You were looking for sample*d* which in your judgment would show commercial values?

A. I was.

Q. Did you take any other samples except those which were taken by you with Mr. Bardley?

A. No, sir.

Q. You heard his testimony?

A. I did.

Q. About those samples?

A. Yes, sir.

Q. The surface from which each sample was taken?

A. I did.

Q. And without going over that again with you in detail, would his testimony in that regard coincide with your observation?

A. Yes; I believe that his testimony is absolutely correct on that point.

Q. Did any of the samples which you and he took—I will ask you if any of the samples which you and he took were taken from rock, that you did not in your opinion believe to be rock in place?

A. Every one of those samples, in my belief was taken from rock in place.

Q. I will ask you if in A-Raise you found any ore or quartz which was like in appearance to the ore and quartz which you found in the McNamara stope northerly from that A-Raise while you were working in the McNamara employment?

A. Do I understand the question: If I found no ore in A-Raise similar to the ore——

Q. Yes.

A. Why, yes, I did.

Q. Is there any peculiarity to the ore?

A. Yes, there is a peculiarity about that particular ore.

Q. What was the peculiarity?

A. Well, there was a character of ore there throughout that part of the country, down through the McNamara and also observable in A-Raise, known to the miners as a rhodonite ore.

357 Q. Have you a sample of the ore?

A. I have.

Q. Just show that to the court and point out anything that is peculiar?

A. Now this ore some of the miners——

Mr. Lindley: Better identify that if you want to put it in evidence. The record won't show what it is.

Mr. Dickson: I will have to identify it.

The Witness: This ore—I will have to explain is recognized by the miners as a rhodonite ore, and others call it a pink manganese owing to the pink color, owing to the construction of the rock, but those are two names commonly known to the miners; rhodonite and pink manganese; owing to that pink manganese being har- to get around we had better call it rhodonite ore.

Q. Where was this sample taken?

A. This sample was taken from the McNamara mine.

Q. Recently by you?

A. It was.

Q. Did you find similar ore in the A-Raise?

A. I did.

Q. How extensively did this ore occur in the McNamara stope?

A. Why, that same character of ore was very noticeable in all the McNamara stopes from which came commercial ore or high grade ore.

Q. Is there a mark on that so that it can be identified? Mark it with your name, "H"?

A. Probably I can do it with a colored pencil.

Q. All right.

(Witness marking exhibit.) "H-1."

Q. You have marked it H-1?

A. "H-1."

Mr. Dickson: I offer that in evidence, if the court please.

Q. Did you find that same kind or ore in any other of
358 these raises that you have been testifying about?

A. I did.

Q. Which one or ones?

A. I found the same character of ore in raise designated A-4.

Q. About how far up the raise?

A. Well, the exact number of feet I do not remember. Something like forty or fifty feet.

Q. Did you take a sample of it for assay or not?

A. I don't remember if there was a sample taken across that particular spot for assay or not.

Q. Did you leave any of it there?

A. Yes, there is a large bunch of it, quite a little body of it.

Q. And is that true also of A-Raise, any ore left there?

A. There is not as much of it in A-Raise as in 4-A.

Q. Is there any left in it now?

A. In 4-A?

Q. No, in A?

A. There was when I was there, yes.

Q. Now did you go up any of the raises on what we call the south dipping vein?

A. I did.

Q. Starting at the most easterly one, describe to the court what you observed in it, giving it- number.

A. The most easterly raise in the West End territory, is designated here as 569 raise; that raise commences from the old stope, I think it is called 500-C.

Q. You think that the stope is?

A. Yes; and the raise continues upward on the dip of the vein for a distance of about seventy five feet. At this point the quartz or the vein in 569 raise terminates against the north dipping wall of quartz.

Q. Go to the next one?

A. 571 raise commences from the same 500-C stope and continues upward for perhaps 50 feet, when the vein in the raise terminates against another north dipping wall of quartz.

359 Q. Go ahead to the next one?

A. 573 commences from 500-C stope, and continues upward on the dip of the vein; the vein continues up until it reaches 561 drift where it terminates against a north dipping wall of quartz.

Q. Well, the next one?

A. 575 is in the south dipping vein the whole distance.

Q. Opened up into a red stope?

A. Opened up into a drift not a stope.

Q. Did you say that last raise that you spoke of connected with the 561?

A. It is south dipping quartz——

Q. What drift does it connect with?

A. 405-drift.

Q. Now these samples that you took in connection with the samples that you took with Mr. Bradley, what did you do with them?

A. Those samples were taken by us and kept in our possession constantly from the moment they were taken until the moment they were delivered into the hands of the Assayer.

Q. From your experience as a miner and from your examination of the underground workings in the mines here involved, how would you classify, or what would you call this north dipping vein, or the vein having a southerly dip?

A. I would call the south dipping vein a Fissure vein.

Q. As you went up from the bottom to the top, or down from the top to the lowest workings, that you were in on the south Fissure vein, you may state whether the fissure was observable?

A. Well, following down on the dip of the vein we followed the same vein continuously from top to bottom, without leaving that vein and going into any other vein.

Q. Well, were you in a fissure—did you follow down a fissure?

A. Yes.

Q. And what kind of a vein would you call the north dipping vein?

A. I would call the north dipping vein a fissure vein also.

360 Q. What in your opinion Mr. Hoxey, as a miner, with the knowledge and observation that you have been able to make, of this south dipping vein, would you call the top of that vein?

A. What would you call the top of the vein?

Q. Yes.

A. I would call it the apex of the vein.

Q. Well, but where, whereabouts in your judgment would you define the top of the south dipping vein?

A. Because the vein in its——

Q. Oh, no, you do not hear the question. Where do you find it?

A. Against the foot wall of the north dipping vein.

Q. Where it intersects or comes in contact with the south dipping vein?

A. Where it comes in contact with the south dipping vein.

Q. That is what is in your judgment the top of the south dipping vein?

A. It is.

Q. Are you from your observations while the work of stoping was going on in the McNamara, and while you were foreman, able to tell the court anything about the hanging wall of that north dipping vein what its appearance is?

A. Yes. Through nearly all of the workings of the north dipping vein of the McNamara we have a nice full gouge hanging.

Q. Have you made an examination of the territory in the immediate vicinity of Raise-A?

A. I have.

Q. And where you have a north dipping and south dipping structure?

A. I have.

Q. I wish you would describe to the court what is the appearance in that place, at that line of junction, of the hanging wall of the south dipping vein?

A. Well, the hanging wall of the south dipping vein is what a miner knows as a frozen hanging wall. The quartz is frozen to the country rock immediately overlying the vein in *in* such a

361 manner, that if you want to take all the quartz down you will have to take a little of the hanging wall, or if you want to leave the hanging in place, you will have to leave some of the quartz there.

Q. And what is the appearance of the hanging wall on the north dipping vein, at that line of juncture?

A. The north dipping vein at that point is through a nice smoothe hanging wall with a gouged condition between the ore and the hanging wall.

Q. What differences, if any, are there between the north dipping vein and the south dipping vein?

A. Why there is numerous differences including the differences in the hanging walls of the two veins, the veins are different in their dip and there is a difference in their strike, and they are even, as far as I can see, different in the extent of their ore.

Q. In what?

A. In the size of the ore bodies found in both veins.

Q. Was the McNamara stope, out near this west end—that stope in which A-Raise is now found, continued while you were foreman there, until you got to the boundary line between the two properties, the West End and the McNamara?

A. It was.

Q. State what, if any, difference there was in the values, thickness or size of the ore, as you passed from that portion of the stope which had a north dip to that portion which had a south dip?

A. Why, as we stoped up on this north dipping, vein, we had a very rich stope in this section, or most of it, in fact there was very good ore; it was very high grade ore in a commercial way at that time, and when we came to the place where the stope started down,——

Q. Southerly?

A. In a southerly direction in the south vein—why the ore along there lost its value; that is it lost its value in comparison to
362 what we had, on the slope of the north dipping vein.

Q. How noticeable, how broad was the change in value?

A. Well, the ore taken out in the north dipping vein, was a very good grade of commercial ore at that time, while the ore in the south dipping vein was of very poor value; it was very disappointing in value.

Q. Was it shipping ore?

A. There was a small portion there that we took out for shipping, yes.

Q. And in the north dipping vein was it shipping ore up to the place of contact with the south dipping part of the stope?

A. It was.

Q. While you were foreman of the McNamara—when did you cease being foreman?

A. Why, I ceased being foreman in May, 1910.

Q. At the time that you were foreman of the McNamara did you know of any break in this roll, in which we find this common stope down at the West End?

A. No, sir.

Q. What did you consider it to be then? That feature of it?

A. Well, the only thing to consider, was the natural conclusion that it was a roll.

Q. That is what you believed it was at that time?

A. Yes.

Q. And the roll, the crest of the roll, you know what we mean by that—while you were foreman there, I will say before 1909, had it been disclosed anywhere else except at this westerly portion?

A. Had the crest of the roll been disclosed anywhere else?

Q. Yes.

A. Not to my knowledge, no sir.

(At this time an adjournment was taken until two o'clock P. M. December 11th, 1914.)

363 December 11th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

B. I. HOXEY on the stand for further direct examination.

Mr. Dickson.

Q. You may proceed with the cross examination, Judge Lindley.

Cross-examination.

Mr. Lindley:

Q. I understood you to say Mr. Hoxey that at one time you had been the foreman of the McNamara Mining Company?

A. I was.

Q. Was you the foreman at the time that Mr. Chandler was superintendent?

A. I was part of the time; I went there as foreman after he had assumed charge as manager.

Q. That was about the time that the McNamara Company was in trouble with its neighbor?

A. Well, I believe that the litigation had started in December of 1906, and I went there in March 1907.

Q. Do you refer to the West End litigation of the Extention litigation?

A. The West End McNamara litigation.

Q. 1906?

A. Yes, sir.

Q. As early as that?

A. Well, the mine was tied up in litigation when I went there in '07, in March.

364 Q. Well, then, you went there at approximately about the time of the litigation?

A. I was there during that time.

Q. And you knew what the West End had to meet in that case did you?

A. Yes.

Q. And you felt at that time, as I understand your testimony, that this was one vein that rolled over from a north to a south dip?

A. That was my belief, yes, sir.

Q. But you have changed that belief?

A. Well, certain development work upon the north dipping vein has changed my belief, and a careful study of the situation.

Q. Well, the conditions existing at that time necessitated a rather close study didn't it?

A. It did.

Q. And you as an employee of the McNamara did your best to find out what the truth was?

A. I certainly did.

Q. And it was your conviction that there was but one vein that rolled from the north to the south vein?

A. Yes, sir.

Q. That was your understand- up to what time?

A. Until I inspected the property here in the month of November 1913.

Q. Where were you employed at the time you undertook this investigation? for the West End people?

A. I was down in Nevada City.

Q. You were in Nevada City?

A. Yes, sir.

Q. Not in this town at all?

A. No, sir, I had been in this camp until about three weeks before being in the employ of the West End Company, when I went to California and I returned from Nevada City, after an absence of about three weeks.

Q. Now, at about the time of this old controversy between
365 West End and McMamara, were any of these series of raises that you have testified to, run?

A. Not to my knowledge.

Q. Calling your attention to what you have identified as raise 5-A, had that been run?

A. Not to my knowledge, I did not know anything about that raise at all.

Q. Did you hear Mr. Chandler's testimony?

A. I did.

Q. You heard him state that it had been run?

A. Yes.

Q. But you did not know anything about it?

A. No, sir, I did not know that that raise was in existence at all.

Q. You were foreman of the mine?

A. I was, of the McNamara.

Q. Of the McNamara?

A. Yes.

Q. Cooperating with Mr. Chandler and the balance of us in developing the suit at that time?

A. Yes.

Q. There is nothing in 5-A different from what there is in the other raises?

A. Why, practically not. The only difference as I stated in my direct testimony, is a condition that exists in 4-A, different from the rest of those raises.

Q. To that extent you say that there is a difference?

A. Yes.

Q. That difference is not very marked Mr. Hoxey?

A. Well, no.

Q. When you were stoping this stope at the extreme west end of the McNamara workings in the neighborhood of stope -A where you say that you stoped the ore from the north to the south dipping vein, that stope was all made at one time or progressively made, and folded over to the north dipping vein.

A. There was a portion of it made at that one time.

Q. Well, you did not recognize anything more than what
366 you concluded at that time to be the same vein, was a roll?
A. Yes, the same vein.
Q. The ore that was taken out of those stopes how was that ore treated?
A. How was the ore treated?
Q. Yes.
A. At that time it was treated by smelter, hand sorted.
Q. Hand sorted?
A. It was.
Q. Did you separate in the separating process the ore that came from the north from that which came from the south dipping vein?
A. Did we separate it,—from what?
Q. From itself?
A. Why every bit of that ore was sorted in the ore bins.
Q. It was all sorted together as it came into the ore bins?
A. Yes, all sorted together.
Q. All stoped at the same time?
A. No.
Q. Well, I mean, as a continuous process?
A. As a continuous process it was all stoped at the same time up to a point which you call the crest.
Q. Was it all stoped out until you reached the west end line?
A. No, sir.
Q. What happened when you got to the crest?
A. Well, when we got to the crest we realized that we could not mine this ore as cheaply by shoveling it up hill and over the crest as we could if we had an upraise from underneath, so the ore could be immediately shoveled into a chute as it was broken.
Q. On that part of what you considered to be one vein at that time, you carried on underhand stoping?
A. You would, if you stoped this ore in the south dipping
367 vein, over this opening in here.
Q. How was that ore extracted; was it extracted continuously or did you put up an upraise and stope from that side?
A. We stoped all the ore that showed the desired value up to this crest, and when we seen that ore was going over, we continued stoping here, and in the meantime we went down into the McNamara on the 200 level and run a cross cut in until we reached the line, and then we made an upraise at that point, if I remember, that was just within the McNamara side lines, parallel to the side line, and we held through, and intersected the south dipping vein, the foot wall of the vein with that upraise.
Q. So that the stope was worked in both directions?
A. It was worked in both directions.
Q. Do you recall a particular drift and upraise that was run by the West End company along in the neighborhood of that stope?
A. I do.
Q. What did you used to call it in the old McNamara days?
368 A. Why, it is as near as I can remember; I don't remember just exactly what they did call that.

Mr. Dickson: What the MacNamara people used to call it, I object to as irrelevant, and immaterial.

Mr. Lindley: Well, what the witness used to call it.

Mr. Dickson: The question was what the MacaNamara people used to call it.

Mr. Lindley: Well, he was the MacNamara people. I withdraw the question and reframe it at the suggestion of my friend, Judge Dickson.

Q. What did you call it, Mr. Hoxey?

A. Why, just what the name of that was I don't recall, but we knew it as the side line litigation work.

Q. Side line litigation work?

A. Yes, sir, that is about the only thing that I can recognize it by.

Q. You thought they were hunting for an apex in that, didn't you?

A. Yes, sir.

Q. You examined that upraise in that drift as it went in?

A. I did.

Q. Pretty carefully?

A. I did.

Mr. Dickson: What raise is that, Mr. Lindley? Will you have it designated?

Mr. Lindley: I think you have it marked here.

The Witness: 152 raise, and this raise down here up to this level is 258 raise. 258 raise and 152 raise and the drift connecting the two.

Mr. Lindley:

(Q.) You examined that pretty carefully as it went on, didn't you?

A. I did.

Q. Well, practically you were examining -verything that
369 the West End people did there, were you not?

A. Why, yes I went through the works occasionally and see what new works they was opening up and what they was doing in their old works.

Q. You were getting ready for a law suit?

A. Yes sir.

Q. Now, you do not connect that present drift now with any of the recent workings, say, raise A, for instance? Has that got anything to do with what is shown in raise A?

A. I believe not.

Q. You believe not?

A. No.

Q. You said there was a gouge overlying the north dipping vein?

A. I did.

Q. When did that gouge occur prominently?

A. Well, that gouge occurs most prominently between the quartz and the overlying country rock.

Q. As a blanket overlying all of this stoped ore?

A. It does.

Q. Do you find that gouge running out at all from the vein into any faults or into any cross cuts that you have or drifts running away from the vein in the hanging wall?

A. No, not that I remember of. I don't beliebe that I ever did observe such a condition.

Q. That gouge that you speak of, then, you are sure is not local at a certain point in the stopes in the west MacaNamara workings?

A. No sir, the same condition can be perceived in the eastern working just the same as the western working.

Q. Then, you describe these veins, you state that two veins, that is, according to your later revelations and later investigations,
370 that the north dipping vein has a character-stic difference from the south dipping vein in that it has a gouge hanging wall?

A. Yes sir.

Q. And that the south dipping vein has not?

A. Yes sir.

Q. That is correct, is it?

A. It is.

Q. That is true of all the observed parts on both the north and south dipping veins, as far as you have seen them?

A. As far as I have seen them.

Q. Well now, with reference to this rhodonite ore, is that what you call it?

A. Yes sir.

Q. Who invented that name for it, do you know?

A. Why no, I do not, but I know it is commonly known among the miners as rhodonite or pink manganese ore.

Q. Well, that is owing to its pink color, I suppose?

A. Pink color and I suppose some of the ingredients of the ore which they constructed into those names for some reason or other.

Q. Well, you want us to understand, then, that another essential difference between these two veins is that in the north dipping vein, including the upraises, the theories of what we call the A upraises carries rhodonite ore, and there is none found in the south dipping vein?

A. No; no sir, I did not testify to that fact at all.

Mr. Dickson: All I asked him was if he found that same rhodonite ore, whatever he called it, in two of those upraises that he found in——

Mr. Lindley: Yes, you studiously avoided asking him anything about the south dipping vein. I am asking him if he wants
371 to leave that impression. I noticed that you did not ask him if that same occurred in the south dipping vein. I ask him if he wants to leave us with the impression that that was a distinctive feature. It certainly left me with that impression.

Mr. Dickson: Go ahead.

Mr. Lindley:

(Q.) How is it about that rhodonite ore, why do you utilize that

as a distinctive feature of this north dipping vein if it occurs in the south dipping vein?

A. Is that a question?

Q. Yes sir.

Q. Why, I did not quite catch it.

Q. Read it please, Miss Reporter.

(The reporter read the question.)

A. Why, I did not know as I used it in a distinctive feature.

Q. Well, it does occur in the south dipping vein?

A. It does occur in the south dipping vein in places, so I am told, but there is one feature that I can remark about that rhodonite ore, that when we were stopeing in the MacNamara down here, for a space of several hundred feet, that the rhodonite ore was always accompanied by the high grade ore in the stopes that we extracted. That is, that we never did find any high grade ore to any great extent but what there was more or less of this rhodonite ore, and you can always find it, in fact, it seems to be an indication of this ore, but at the same time you can find it in veins that carry not very much value. In fact, it is not commercial ore. And about this south dipping vein, I have been down through there and I have seen stope after stope that carries none of this rhodonite ore what-
372 ever.

Q. Did you make a special investigation to determine whether it carried any rhodonite ore or not?

A. I did.

Q. What is your conclusion?

A. My conclusion was that the south dipping vein does not carry that rhodonite ore in proportion that the north dipping vein does.

Q. To what extent did you make a search in the south dipping vein for this occurrence of rhodonite ore? Withdraw that question for a moment. Did you make any distinct investigation in the south dipping vein with reference to the occurrence of this rhodonite ore?

A. Why, I didn't make no special search, no.

Q. Well, you did not have in your mind, then, the characterization of the north dipping vein as a separate vein simply because it carried the rhodonite ore?

A. Not simply, no not for that exact reason.

Q. And if it should be found indiscriminately throughout the south dipping vein, it would not be a distinctive characteristic of the north dipping?

A. I didn't catch the question.

Q. Read it please.

(The reporter read the question.)

A. That it would not be a characteristic?

Q. Read the question again. I have asked it once and if he can not understand it, why, I am sorry. Perhaps I am a little diffuse in my statement of the question.

(The reporter read the question.)

373 Mr. Lindley:

(Q.) Now, if you can not answer, Mr. Hoxie, I do not want you to answer anything you can not answer.

A. I can not answer that intelligently, Judge.

Mr. Lindley: All right. I will excuse you if that is your explanation, you say you can not answer it. Take the witness.

Redirect examination.

Mr. Dickson:

(Q.) Do you wish to be understood as saying that in your judgment there is none of this pink manganese ore, called by that name, in the south dipping vein, or that you have not observed it?

A. I did not say that there was none of it, there.

Q. I understand that you have been informed that there is plenty of it, the same character of ore in the south dipping vein?

A. Yes, I understand that the same does exist in quantities in that vein.

Q. When was it that you ceased to be foreman of the MacNamara mine, if you can give us the date?

A. Why, I ceased to be foreman there in May, 1910.

Q. Now, during that period, while you were foreman there, after the litigation between the MacNamara Company and the West End Company had been terminated, did your duties carry you into the West End workings after that litigation was settled?

A. Why, no, not until the present time.

Q. After you ceased to be foreman and prior to last month
374 when you were employed to make this examination, had you been through the underground workings of the West End?

A. I had not.

Q. You were called attention to the 2 raises that had been made while you were foreman of the MacNamara, raises made, however, by the West End Company, 158 and 252?

A. 258 and 152.

Q. 258 and 152?

A. Yes.

Q. I see 152. Where is 258?

A. That is 152.

Q. Yes; now where is 258?

A. Here is 258 here. That is the first raise that comes off the 200 level and connects this drift here with 152 raise.

Q. I will ask you whether you know that those raises, either or both of them are in the hanging wall country of both veins?

A. Why, no, I don't know.

Q. You do not know about that. Let me call your attention to 152 raise. What color is that?

A. 152 is green color.

Mr. Lindley: Now, Mr. Dickson, I submit the witness is testifying

and he ought not to have his attention called to the colors indicating——

Mr. Dickson: I am not going to ask him what that green color represents. Simply for the identification on the record. He don't know, as I understand. I am not trying to help the witness and always try to refrain from doing so. I think it is improper.

Mr. Lindley: I believe you do generally, I agree with you.

375 Mr. Dickson:

(Q.) When the upraise that you described to Mr. Lindley that you had made for the purpose of avoiding underhand stopeing, and through which you have a chute there to take down the ore from the south dipping vein, do you remember that distinctly?

A. I do.

Q. What was done with that? How were you treating the ore at that time, smelting?

A. We were sending to the smelter.

Q. When you broke down that ore from the south dipping vein over the crest of the roll, you started south and went down to the line, what was done with it?

A. There was a small portion of it sent to the ore house of the first ore that was broken. But by continual assaying it and sampling, we found that there was no profit in that little stope in there, and there was a great quantity of that ore that was left in place when I ceased to be foreman there.

Q. Well, you were foreman. Do you know why it was left in place while you were foreman?

Mr. Lindley: I suppose it may be conceded that owing to the conditions in the camp at that time, it could not be shipped at a profit.

Mr. Dickson: That is all I wanted to show. That is all. Now, Mr. Lindley, acting upon the suggestion that you kindly made this morning, I had the assayer, Mr. Bowman make a certificate of the result of his ass-y of the samples that had been delivered to him by Mr. Bradley and Mr. Hoxie.

Mr. Lindley: I have agreed with Judge Dickson to accept
376 the assayer's certificate.

Mr. Dickson: As the correct results, correct assay?

Mr. Lindley: Yes.

The Court: It may be known as Defendant's exhibit L.

Mr. Dickson: Call Mr. Winchell.

Testimony of HORACE V. WINCHELL, who, being called and sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is your full name, Mr. Winchell?

A. Horace V. Winchell.

Q. And what is your age?

A. Forty-nine.

Q. Where do you reside?
A. Minneapolis, Minnesota.
Q. What is your profession?
A. That of a mining geologist.
Q. Where did you study your profession?
A. I began my studies at the University of Minnesota. Perhaps I should say that before going into the University I grew up in a geological atmosphere.
377 Q. How is that?
A. Before going to the University I grew in a geological atmosphere.

Mr. Lindell: I want to extend to Mr. Winchell the same complement that I have to the others. I accept his qualifications.

Mr. Dickson:

Q. What is the geological atmosphere that you refer to?
A. My father was a geologist and I was when a small boy taken by him into the field in geological investigations, so that I heard geological matters discussed from the time when I was able to understand it. I graduated at the University of Michigan, where I studied chiefly with my Uncle, another geologist of some note.
Q. What is his name—Alexander Winchell.
A. Alexander Winchell.
Q. Was he a Professor in the University of Michigan? A geologist?
A. He was.
Q. When did you graduate there?
A. In 1889.
Q. Now, how continuously since then Mr. Winchell have you followed your profession of Mining Geologist and Engineer?
A. I have engaged in the study of Geological conditions, investigation of mines, constantly for the past twenty-five years.
Q. Will you state—I do not mean to go into great detail with it, but in a quite general way the different countries in which you have been called upon—state-, territories and other countries to make examination of mines for the past twenty-five years, and what your object was in making those investigations. Whether it was simply a s-ientific investigation for your own satisfaction, or whether
378 you were employed by people to make examinations and report upon mining districts for them.
A. For about three years after graduation I was engaged in geological survey work in connection with the investigation of the Iron ores and somewhat of the copper formations of the Lake Superior region; I then went into the employ of mining companies making geological investigations of properties and taking charge of the exploration for Iron mines. At that time I made the first report upon these Mesabi Iron range in Minnesota, which has since become famous as the greatest Iron district in the world. From that my field of work extended to the western part of the United States, and I engaged in general examination work, the investigation of mines, as to their

value, the geological structure, and in connection with various mining enterprises examined mines in all of the states of the west, I think, without exception, as well as in the Lake Superior region, Canada, in Alaska, in Mexico, in Sweden and in South America.

Q. You have been actively engaged for the past twenty-five years in the practice and pursuit of your profession?

A. Yes.

Q. Have you during that time at intervals been employed in the direction of mining operations on properties?

A. As consulting geologist directing the development of the mines, I have; I have not had the executive management of properties.

Q. Well, in that capacity give us the names of the principal mines you were so connected with?

A. My principal employment in that connection has been in Butte; I resided in Butte for eight years between 1898 and
379 1906, and during that time was in charge of the various — of the geological department of the various mining companies, associated or affiliated with the Amalgamated Copper Company—advising in the development of the mines. I have also been engaged in similar work in the Cœur d'Alenes in Idaho, and in other districts some in Colorado and in Utah.

Q. You have made an examination of the properties involved in this controversy?

A. I have; I have spent perhaps five weeks in the study of the conditions underground.

Q. Was that examination so made by you for the purpose of ascertaining the character of veins that were encountered in this country, their course, strike, direction, dip and top or apices of them?

A. It was.

Q. And have you reached a conclusion as to the course, direction or strike of the veins, encountered here, and as to the dip of the respective veins and the apices of the veins if there be more than one?

A. I have.

Q. I wish now Mr. Winchell, without further interrogation, you would take up the result of your observations and explain to the court what observations you made and then, in conclusion what your opinion is; use whatever will best illustrate what you wish to convey to the mind of the court, the cross sections of the mine wherever it will better aid you.

A. The mines of the West End and Jim Butler companies, are upon quartz veins which are found in volcanic rock. The volcanic rocks occur in a series overlying each other. They were either poured out as lava in flows, or injected into each other as intrusoins, or blown out of the crater of volcanoes as ejectamenta and fell upon the surface of the ground accumulating in considerable thickness. These rocks are what the geologist- call rocks of medium acidity, that is, they are not extremely siliciceous, nor are they noticeably poor in
380 silica. It is important in this case however, to state that all of the rocks found in these mines contain more than fifty per cent of silica, and some of them contain as high as seventy-five per cent. The oldest, or lowest, I should say,—the lowest forma-

tion which I have observed in the West End territory is that of a rock which has been called West End Rhyolite, this rock is colored brown upon the model, and the cross sections exhibited in this case. Lying above this rhyolite is a rock which has been called in the testimony heretofore, trachyte; trachyte has also been termed "altered andesite." In the veins chiefly occurring above the trachyte is found the andesite, and intruded into the andesite or abutting against it, or lying upon it in the western portion of the West End territory is what is known as the Brougher Mountain dacite breccia. The trachyte is colored violet or purple upon the model and the sections; the andesite is colored light green, and the dacite breccia, dark green. Now, althou*hg* that is the order in which these rocks occur, from the lower horizon as to the surface, it may not be the order in which they entered this district. There are some indications, although I am not satisfied sufficient to call it conclusive evidence, that the West End Rhyolite entered the trachyte as an intrusion instead of having been deposited before the trachyte. These rocks suffered the vicissitudes of a complex geological history. The trachyte was evidently, at some time, shattered by internal movement, and from it emerged or emanated solutions carrying silica; it is a well known fact that all lavas, all magmas, as they are termed by geologists, upon cooling emit large quantities of steam, which steam when it becomes sufficiently cooled becomes water, and these waters of a high temperature dissolve from the rocks and carry into the lines of easy percolation minerals, chiefly silica, and there deposit this silica; the rocks,
381 therefore, that we find before the formation of either of those veins was started are silicified. Large *Large* masses, irregular masses, (but with a general north and south trend and a vertical or easterly dip) of quartz were deposited in the trachyte, and to a certain extent in the rhyolite, before the veins were formed. The rocks themselves were mineralized by silica very extensively; the original mass of the andesite which has now been altered to trachyte, as it is called, was penetrated through and through by silica, so that the rocks as we find them to-day are more silicified than at the time of their first deposition. The next important event was the formation of the West End main vein—the south dipping vein. This vein is a fissure vein, which has been followed by replacement or substitution. Now, by a fissure vein I do not mean a vein which occupies what was once a wide open crack in the earth, the text book conception of a fissure vein is the ideal conception; it is one which is seldom found exemplified in nature, particularly where the dip is low. It is easy to understand how a vertical crack in the rock might remain open for a limited,—to a limited width, to a considerable depth, and be filled by quartz, but it is inconceivable that a vein of low inclination should be formed in an open cavity, or open space, because the strength of the rock arches, which might be imagined to exist there is insufficient to maintain the open channels. The familiar class-room illustration may be represented by this paper. If a fissure is formed by a spreading apart of the rocks, it is seldom a perfectly plane fracture. If, then, one side moves in relation to the other we have shoulder abutting against shoulder and intervening

spaces, which accounts for the pinches and swells often found in the veins. In this case there was no open fissure, of large dimen-
382 sions, there was rather a plane of shattering, along which, and in its upward course water rose, replacing the fragments of rock, and depositing quartz. It must be remembered that some of this rock was already silicified; it was not unaltered andesite; the vein was deposited or formed, thereafter sometimes with silicious rock, amounting even to quartz upon one or the other wall, and qiartz therefore sometimes constitutes the country rock of the south vein, as well as of the north dipping vein, of which I will now speak.

383 Slightly subsequent to the formation of the south dipping vein was formed the north dipping vein. This vein followed a line of fracture like the south dipping vein. It probably was accompanied by considerable faulting movement. It passed across and interrupted the south dipping vein on its course. There may have been and probably was an upper segment of the south dipping vein which has since disappeared by erosion, and if it exists at all remains in the form of a small stub of a vein in that portion of the trachyte which overlies the north dipping vein and extending upward for a fewᵂ feet to the andesite cap.

The evidences of the later formation of this north dipping vein are to be found, first, in the fact that the north dipping vein extends up above its intersection with, or meeting point with the south dipping vein. There are several workings in the ground which I will mentione later which prove beyond question the continuity of the north dipping vein upward to the south above and beyond the south dipping vein.

The next evidence of later origin of the north dipping vein is the fact that it is much less important than the south dipping vein. It is a smaller vein, it contains less ore; it is not so thick, and furthermore, it has not so completely replaced and silicified the rock material that was formed by its movement. The south dipping vein is a completely silicified vein. There is very little gouge or selvage above it. When it was formed first as a fissure, it was substantially full of rock which rock has been changed into quartz—completely changed. The north dipping vein is a fissure
384 which, likewise, contains quartz, but the country rock which was within its limits or within the reach of its solutions, has not been so completely changed into quartz. There was later a movement along the north dipping vein——

Mr. Lindley:

(Q.) May I ask a question at this juncture?

A. Certainly.

Q. When you say the formation of the vein, do you include its mineralization?

A. Yes, I should speak of the two, perhaps separately, the fissure first and the vein afterwards.

Q. You have used the formation of the fissure, and then the vein,

and I wanted to know what you included so I might follow you as you went along.

A. When I say the formation of the vein I do not refer alone to the formation of the fissure, but to the whole process of formation of the vein.

Q. Of mineralization?

A. Yes sir. Beginning with the formation of the fissure and including its subsequent filling.

There was later a movement which had a singular effect and which is beautifully registered in the ground. This movement was to the east along the plane of the north dipping vein. It was not solely on top of it. There was a movement of the ground and the vein itself. There was probably greater movement between the vein and the hanging wall rock than there was in the vein, but they both moved. This movement is recorded in the ground at the points of meeting of the south dipping vein and the north dipping vein. I can represent by my two hands——

Mr. Dickson:

(Q.) You mean the meeting in the upper course, or on
385 their onward course?

A. Both, wherever they meet. The north dipping vein overlying the south dipping has moved easterly (indicating) and the result has been that where the south dipping vein was a solid body of quartz, not completely shattered, it has acted as a knife edge, cutting into the north dipping vein so that in places we find the quartz of the south dipping vein projecting into the north dipping vein within 18 inches or 2 feet of its hanging wall; a very interesting and unusual occurrence. First the north dipping vein overlies the south dipping vein. Then, a movement along the line of intersection towards the east caused the south dipping vein to cut into the quartz of the north dipping vein, so that at that precise point there is less thickness in some cases over the upper edge of the south dipping vein than there is above and below it in the north dipping vein. It must be kept in mind that there was a great deal of erosion, probably before the andesite covered this country. This erosion probably accomplished two results: it swept away in all probability a portion of the upward extension of the north dipping vein south of the line of intersection with the south dipping vein, and it also removed the greater portion of the faulted segment of the south dipping *b*vein above the north dipping vein. How far the north dipping vein originally extended to the south, there is no means of telling, because in some of the raises we have already reached the cap rock, and it is not far distant from any of them at their upward termination. After this cap rock was deposited over the surface of the ground, came a still later volcanic disturbance, which we now find represented
386 in Mount Brougher. That mountain consists largely of volcanic breccia. That is to say, it is made up of fragments of lava which were blown into the air, and which fell back again upon the ground and which are mingled with fragments of rock and

through which the volcano emerged, exploded. We have in that breccia fragments of quartz, fragments of trachyte, fragments of andesite. We know it was a violent eruption which destroyed and obliterated the westward extension of the veins.

Coming now to a description—if you have no particular question?

Q. No.

A. Of the facts observed in the ground. My attention was first directed to this ground in April, 1914. At that time, raises 488, 2 A, 5 A, 6 A, and 7 A had been extended upward upon a north dipping vein for a considerable distance above the line of meeting with a south dipping vein. Some of those raises have been extended further since that time. At the east end of the West End claim there are stopes of considerable dimensions upon the south dipping vein.

These stopes have been connected by upraises with the 400 level of the West End Mine.

Raise 569 is the easternmost of these raises. This raise shows a large vein of quartz, dipping to the south at an angle of perhaps 35 degrees, it becomes flatter at greater depth, coming up towards the north until it meets a north dipping footwall plane of a vein. This plane is marked—I should say the angle was something like 45 degrees to the north—this plane is marked by a band of breccia,
387 crushed quartz, by a layer of dark quartz and a band of white quartz, above which we have a large north dipping vein.

I should say, perhaps, that I believe that the mineralizing solutions which came along the plane of the north dipping fissure introduced additional silica or quartz into the rock in the immediate vicinity of, and beneath the south dipping vein. There was a double period of quartz deposition caused by the two veins in the immediate vicinity of their juxtaposition. It is a fact of common observance that when two veins approach each other on strike or dip, no matter whether they actually come together or not, the intervening country rock is liable to be shattered and filled with more quartz than is found at an equal distance away from either one of the veins alone.

Here we find a larger amount of quartz immediately around the line or the point of meeting of these two veins than we have found in the rock generally, and the rock generally contains a good deal of quartz.

The raise 569, together with raise 571, which is about 25 feet to the west, and presents similar conditions, illustrates to my mind precisely the conditions which might be expected where two veins of divergent strikes and dips approach each other and actually come together. Under the conditions of such intense sili-fication as I found here, it is not surprising, even, that the territory in the immediate vicinity of the two veins should be completely changed into quartz, and there should be an appearance of a fusion of the two. When we take into consideration, however, the fact that the south dipping vein has a strike of about North 70 degrees east, and the north
388 dipping vein has a strike of about north 40 degrees west, and realize that those veins dip in opposite directions, the reason for my conclusions, which I will announce shortly, become more apparent.

Raise 573, likewise, follows up from a stope upon a south dipping vein, pursuing this vein to its meeting point with a north dipping vein.

Raise 461, just above this south dipping vein, discloses the vein dipping in the opposite direction. Beneath raise 461 and north of the upper termination or continuation of 573 we have a considerable body of quartz in which there is no structure visible indicating a dip. It has some of the quartz which presumably was deposited at the later period of sili-fication to which I assign the north dipping vein. It should be stated that in this quartz, which lies beneath the actual line of the metting of these two veins, there is much less banding, less structural evidence than in the veins themselves. The north dipping vein has perfectly beautiful banding of the mineralization, dark quartz and light quartz, silver mineral iron pyrites, etc. within its walls and near its hanging wall.

But beneath in this considerable mass of quartz which is found beneath the line of meeting of the two, no such structure is observable.

Raise 2 A—I think I will refer first to raise 488. Raise 488, which as I said, was made at the time of my first examination last April—at least in part—is followed upward to the south upon a north dipping vein until it reaches the cap rock.

389 Another fact is frequently observed in these apex raises on the north dipping vein, and that is a diminution of the thickness of the quartz as you approach the cap. To my mind, this is referable to the fact that solutions coming up along the plane of the north dipping vein, when they reached the shattered country in the vicinity of the south dipping vein and its walls, were dissipated and scattered and lost some of their hydrostatic force, or the force which would cause them to rise, and consequently less quartz was deposited above the south dipping vein than is frequently found in the north dipping vein below that point.

In raise 488 the quartz diminishes toward the top.

In raise 2 A which clearly shows a north dipping vein of from 2 feet to a few inches in thickness, we observe the same general tendency to narrow as we approach the cap rock, or as we increase the distance away from the line of the meeting of the two veins.

Raise 4 A has been driven upward to the south, parallel with 2 A and 5 A upon the same north dipping vein, but it discloses a little greater amount of quartz, better mineralization, some good ore. There is 4½ feet of stopeing ore in that raise 40 or 50 feet above the top of the south dipping vein. It is over the lower end of raise 2 A that some of the beautiful grooves caused by the eastward movement of which I spoke are to be noticed. They are seen in the hanging wall of the vein and they are observable in the quartz itself.

Mr. Dickson:

(Q.) Just what place is that? I want to make a note of it.

A. At the foot of raise 2 A.

390 Q. Where?

A. Above the foot of raise 2 A. Similar grooves may be

observed in the other raises where the ground has been removed so as to make such observation possible, but there is a splendid example of it right at this point.

Raise 5 A follows the north dipping vein for a distance of perhaps 60 or 75 feet, disclosing the structural features, the hanging wall and the thickness of the vein as I have already described in raise 4 A, with some good ore. And referring to the hanging wall, suggests another point. The hanging wall of both veins is, in general, according to my observation discernible. They are not veins without hanging walls. The parting between the quartz of the south vein and the overhanging country rock, is, however, not marked by a selvage or gouge. This wall sometimes is broken into in stoping operations. The quartz does not always come off free, but ordinarily I can see the wall, what I take to be the wall, and below it replacement sili-fication extending to greater or less distances into the foot wall country. But on the north vein we have a very perfect hanging wall gouge, a selvage of clay, tough, bendable, dark colored clay. This is one of the indications that sili-fication has not proceeded to such an extent in the north vein as in the south vein.

Raise 6 A continued upward upon the north dipping vein is very close to raise 5 A. It shows quartz throughout its extent which is about 20 or 25 feet, and is one of the additional little evidences of the overlying of the south vein by the north vein.

391 Raise 7 A is at the upper end of a long raise called 494, which follows the vein for most—the north dipping vein for most of its distance to the south from 411 west drift. At this point there has been a great deal of shattering. The vein material has not the same banded continuous structure that it exhibits in 2 A, 4 A, 5 A, and 6 A. There is quartz and a hanging wall going up this raise, but it is an illustration of the greater disturbances which have taken place throughout this country a little further to the west.

Q. Where is that disturbed country from 7 A westerly, how far?

A. For perhaps 400 feet there is a gap in the developments. Workings which have been made upon the 400 level and above it in this vicinity have, almost in every case, encountered a disturbed country. It has been impossible to follow the vein for any considerable distance without running into faults. And I should remark there are a great many faults in this mine. The chief fault, or what appears to be such, is called the Edwards fault, and is marked in blue and its course is north easterly, and its dip south easterly at a high angle. It is found along 501 drift for a considerable distance, and it is found in other workings. There are in this camp faults of very great displacement, and a great many faults of lesser displacement.

These faults might be termed major and minor faults. By major fault meaning a fault which disturbs the formations to a considerable distance, bringing blocks of one up opposite blocks of higher, what were originally higher formations. Within these different blocks, there are minor faults. So far as I have

392 observed, the West End and Jim Butler mines, that is, the territory represented upon this model, certainly west of a cross cut upon the 500 level of the Tonopah Mining Company about 150 feet east of the east end line of the West End claim is all within one block and contains no major faults. The faults which I have observed in this ground have not by me been correlated with any of the major faults recognized in the camp. These displacements are, apparently, of limited extent, and are possibly sympathetic with some of the larger fractures, but in themselves do not account for any great displacement of the vein. Along the Edwards fault, the south dipping vein has been strung out, stretched a little, dislocated somewhat, and yet the vein can be followed continuously from the stopes in the western part of the mine easterly to a connection with the stopes in the eastern portion of the mine.

—. ——.

393 A. In the vicinity of the West End shaft.

Mr. Lindley:

Q. There are several shafts on the West end.

A. What is marked upon the model "West End shaft" so called by us, there is the McQuillan shaft, the Porcupine shaft, and the West End shaft.

Q. The shaft that you now speak of, the West End shaft, that is also identified as the Corkell shaft.

A. That I do not know. I have heard the name Corkell shaft.

Q. There are three shafts, the West End the McQuillan and the Corkell. You are now speaking of the West End, so we will agree upon it and understand that when you say the West End you mean what we understand to be the Corkell shaft.

Mr. Dickson: I do not know, Mr. Chandler can tell you.

Mr. Chandler: That is it.

Mr. Lindley: Very well, the Corkell shaft and the West End shaft are agreed to be the same.

A. We have again entered, going westward a less disturbed portion of the ground, and between raise 7-A and the West End or Corkell shaft, the disturbance is so great, and in the West End shaft the cap rock comes down to such a low point that it seems possible that in that space the disturbance of which I have spoken may have left the ground in such a condition that it was easily eroded and that the veins at that point, the north dipping and south dipping veins do not approach to a juxtaposition or contact between their upper edges, that there might have been developments made which would have carried these veins, each of these veins to an independent top underneath this cap; this is strongly sug-
394 gested by the disturbed conditions of this territory but the development has not proven it. As we go towards the west, the upper plane of the surface, which was there before the cap rock came, ascends, in other words we rise towards the west under the cap. We have here in this territory the south dipping vein ex-

tending upward above the 200 level, we also find here a connection with the north dipping vein in a stope; this stope presents the appearance of a dome; the miners in taking out the ore followed continuously in what order I do not know,—but from one *slope* to the other from south to north or from north to south, and if that exposure alone had been taken into consideration and without the knowledge of any overlapping, without the knowledge of the continuation of the vein, with its structure, and the north dipping vein lying against the south—it would have been impossible to predicate such a condition there from these stopes alone; it would appear that there was an continuous connection upon the unbroken vein from a north dip to a south dip, however, raise-A has been made, following a hanging wall of the north dipping vein upward upon a poor variety of quartz, since the solution which deposited the ore apparently failed to reach that particular part of the vein; and by the way, that is nothing unusual in this district; you will see large gaps in the stopes, which does not mean that there is not any vein there, but which mean that it did not generally pay to take it out, and in its general character of impoverishment, did not pay.

Q. These frequent openings or open spaces in the stopes, both the red and yellow stopes, do I understand that those are quartz material or pillars not removed?

A. Yes; they mark the places where the ground now stands, the wooden construction in the model representing the voids or
395 openings, and I believe that it is reasonable to assume that the pillar remains because it was not rich enough to extract.

As we continue further to the west we come to the area which is occupied by the volcano. The quartz of the south vein, like that of the north vein terminates abruptly against volcanic braccia.

Mr. Lindley:

Q. What particular region are you discussing at that point?

A. I said that towards the west this vein terminated against this volcano. In the Porcupine shaft region—but the stopes show for themselves approximately, and the green color shows on the small raises in the stopes where the breccia has been observed and can be observed today. In the ground to the east of the West End claim,——

Mr. Dickson:

Q. Mr. Winchell, before you leave the West End,—I interrupted you with a question—you started in to say something about A-Raise and you did not go back to it. Have you anything to add to that?

A. I think I described it as merely representing a portion of the north dipping vein, which has not been well mineralized and which is more broken and brecciated than any other portion of it.

The hanging wall shows in that raise going up to the south, above the south dipping vein, clear to its uppermost termination.

In the workings of the Tonopah Mining Company, as I believe

them to be, lying to the east of the east end line of the West End claim, we have two vein- there, which are represented approximately in their relation to each other, therefore I believe can be correlated with the south dipping, or main south dipping or main West
396 End vein, and the north dipping vein found in the west end ground. We have a stope which is now being extended upon the south dipping vein above the 500-level.

Mr. Dickson: You had better put a mark on that so that the record will show what place you are referring to.

A. Well, that is the Tonopah Mining stope the only one that there is on the map.

Mr. Dickson: Yes, there are some places on this that we had not time to number. It won't do any harm to mark it.

A. I have marked the stope "T-Co." Tonopah company; this stope that is now being extended is in a south dipping vein similar in its appearance and character of mineralization to the main West End vein, from this stope a raise has been extended upward to the 400-level; this raise passes through the hanging wall country rock and exhibits, at or near its top a small north dipping vein,—thirty feet further north another north dipping vein, sixty feet or seventy five feet still further north a strong north dipping vein which is now being stoped. This north dipping vein has been followed upward by a raise,—it appears on this model to be about sixty-five feet in height; I had an idea it was higher.

Q. Work is going on there extensively?

A. Work was in progress there a few days ago at the time of my examination. I believe that one of these veins certainly corresponds to and represents the eastward extension of the north dipping vein in the west end ground; from their relation to each other, it can be seen that if the raise and stope upon the north dipping vein extend in their present——

[Page 397 of manuscript omitted in original transcript.]

398 "T-Co." is a part of the same vein in which the most easterly Red stopeings, east of the east end line of the West End claim, is shown upon the model.

A. I have.

Q. What is it?

A. I believe that it represents a portion of the same vein.

(At — time a recess was declared until three forty-five p. m. December 11th, 1914.)

399 The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson:

Q. You may proceed Mr. Winchell.

A. The north vein is seen upon the 400 level of the West End mine, very near the east end line of the claim. The point where the

apex of this vein crosses the east end line is not absolutely determined. Raise 488 however is about ten feet west of this line.

Q. West of the east end line?

A. West of the east end line of the claim, and the actual point of crossing of the apex beneath the cap is about one hundred and forty feet—one hundred and thirty or forty feet northerly of the southeast corner of the West End claim.

The north vein upon its course to the west crosses the north side line of the West End claim. This point also is not precisely located by any workings, but connecting up exposures and known points we find the apex of the north dipping vein crosses the north side line of the West End claim about eleven hundred and twenty feet westerly from the northeast corner of the claim, along the north side line.

Mr. Lindley:

Q. Is that particular point designated by any number on the model?

A. There is no such point on the model. It is in space. So it cannot be designated.

Q. You have a yellow indication there at that point?

A. Not precisely, there is no working there at that point. The model only represents——

Mr. Dickson: Let us get at it this way: Show us the point, the first point where you know that the apex of the vein is over the north side line?

A. Raise-A passes upward on its course from the Mc-
400 Namara stope southerly across the north side line of the claim.

Q. Now, where next easterly of that do you know that it is within the West End claim, for a certainty? If we had a triangle here we could fix it.

A. It is to be observed near the top of a raise connecting the 200 level of the McNamara with the 150 raise within the West End territory.

Q. Between that point and——

A. Between those two points the line of apex crosses the line.

Q. And according to your calculation it would be about 1,120 feet?

A. About 1,120 feet, westerly from the northeast corner of the claim.

Q. Proceed with your testimony Mr. Winchell.

A. In this ground there is a third vein developed by workings in the Jim Butler and in the West End, which has some importance here because of its geological relations. It is called the Fraction vein. The Fraction vein is a vein in general parallel upon its strike and dip with the south or West End veins. The dip of the Fraction vein is steeper than that of the West End vein, and they unite upon their dip. I say that, without having an absolutely continuous connection I have seen what I believe to be the Fraction vein at the actual point of junction in the winze, but a raise is now being constructed to con-

nect them. And I have also seen in drift 422 W, the Fraction vein upon its strike.

Q. Now where is that drift? Is that a drift of considerable dimensions?

A. That is a long drift.

Q. About where is that drift? In its most westerly course?

A. Within a few feet of a junction upon strike with the West End or south dipping vein.

401 Q. The main vein?

A. The main vein. The actual point of union is obscured by a little wedge of cap rock which comes lower than the drift at that point. I have no reason to doubt and do not doubt that if this drift had been ten feet lower, the Fraction vein would have shown continuously to a union on strike with the main West End vein.

Mr. Lindley:

Q. On what level is that?

A. That is on the four hundred level of the West End mine. This vein is important because it is entirely in Trachyte. I have described the main north dipping vein and the south vein, the West End main vein, as fissure veins. I say this because, in addition to the reasons which I gave these veins pass through on their course a homogeneous volcanic rock namely, the trachyte. Wherever a line of fracture through the rocks coincides with reasonableness, reasonable approximateness to some other fracture already existing or some other contact already existing this fracture will naturally break across to such plane of contact or other fracture, and so far as possible follow it. But if in its course——

Mr. Dickson:

Q. Why?

A. Because it follows the line of least resistance and naturally takes in the weakest points in breaking the rocks. But if at any point for a considerable distance the vein has actually followed a fracture in a homogeneous rock along which there has been some movement and crushing, I consider it a fissure vein, regardless of the fact that it at some point pursues a plane of contact or a pre-existing fissure.

Q. The Fraction vein being a spur of the main West End vein lies entirely within this body of trachyte; although at some points on its course the main vein pursues the plane of contact between the trachyte and what has been termed the West End rhyolite, it

402 is also true that the south or main West End vein itself, throughout a considerable portion of this territory has for its country rock upon the hanging and foot wall both, the rock which I have called trachyte, as shown upon this model, and as shown upon the sections.

The Fraction vein then unites upon dip and upon strike with the main West End vein; and so far as developed, has above and below it, the same kind of rock.

There is another fact of importance in this connection: Where

the Fraction vein approaches the main West End vein, the intervening wedge of rock has been considerably shattered, and into that wedge of rock the solutions which originally or at one time pursued their course upward along the main West End vein, and the Fraction vein likewise, entered this shattered wedge and there deposited quartz. And we have in that broken wedge some intervening silicification; some small stopes and a good deal of quartz like that which has been found in the north dipping vein above the line of meeting with the south dipping vein. This quartz is in some instances visibly and apparently similar to the ore in the main veins and the ore in the main veins frequently carries the manganese silicate rhodonite, which has been referred to, and the stopes show that kind of ore. Beneath the point of meeting of the north dipping and the south dipping vein the mass of quartz which I have referred to and which is almost structureless although some time showing a north and south direction and vertical dip, is so solid and so massive that workings could be made upon it in any direction.

Q. You are speaking now of the body of quartz found at places between the two veins near their juncture?

403 A. Yes, sir. Workings have been made upon this quartz in various directions. There are horizontal levels; there are curved out domes, made with all the care and precision of an architect's drawing, connecting the south dipping vein with the north dipping vein by a working through this underlying mass of quartz, which, in my mind owes its origin in the first place to the general silicification of the country rock along north and south fractures; in the second place, to the additional quartz deposited in the south dipping vein and in the third place, to the quartz deposited along the north dipping vein.

That body of quartz is quite noticeable in some long workings connecting the north dipping vein with the south dipping vein, but as I say, such workings could be made in any direction and still follow quartz.

I think, perhaps, Judge Dickson, I have answered your question.

Q. Do you wish to say anything about the south branch of the main south dipping vein near the West End?

A. There is a vein, or a spur of a vein, which overlies the large stopes in the western part of the West End mine. This vein unites on its downward course with the main West End vein. Upon its upward course it terminates against the Brougher dacite.

Q. Just refer to the sections in connection with that Mr. Winchell, please?

A. It is shown on section D of Exhibit G. Raise 440, Raise 484, Winze 440, Raise 586 represent the relation in cross section of this south branch of the main West End vein to the vein itself and the cap rock, the dacite cap as shown in the green color terminating its upward course.

404 Q. I do not know whether I asked any other witness the question, therefore I will ask you now, Mr. Winchell: You say this south branch terminates in its upward course against the cap?

A. It does.

Q. And where cut by this plane of section, section D, on Exhibit G, how far does it lie above the main south dipping vein where the branch is intercepted in its upward course by the cap rock?

A. About thirty five feet from the hanging wall of the main West End vein to the foot wall of the south branch.

Q. Calling your attention to section C, we have shown on that as I understand the north dipping vein and the main south dipping vein and the Fraction vein?

A. Yes, sir.

Q. If the main north dipping vein—or the north dipping vein had continued its course upward a little beyond what is shown in this section, and the Fraction vein continued on its course a little further upward, the north dipping vein would have united with that, would it not.

405 A. Yes. It should be explained that this plane of section lies between those two workings. Does not actually cut either of them, at the tops.

Q. I know, but if extended easterly and westerly, they would soon unite?

A. Quite true.

Mr. Lindley: In other words, they are forced into the plane of the cross section?

Mr. Dickson: I say that if both veins were continued easterly or westerly for any considerable distance, and both veins continued on their upward course, as a matter of course they would unite.

Mr. Lindley:

Q. Instead of two veins, it would be a horse in there, wouldn't it?

A. It would, unless the north dipping vein extended still farther.

Mr. Lindley: Well, we won't discuss that. Pardon the interruption.

The Witness: I do not like the term "forced" into the plane of the section.

Q. I mean it does not lie in the plane of the section?

A. If a painter paints a view of a tree, upon the canvas he has got the branches, very few of which are in one plane, but he has got a correct representation of that tree upon the canvas.

Q. Yes, but it is obvious the branches are tied to the trunk. Proceed, Mr. Winchell. Pardon the interruption.

A. I was going to say that the top of raise 422 A on the Fraction vein is 16 feet from the section, and the top of raise 2 A is 30 feet west of the plane of the section.

406 Mr. Dickson:

(Q.) That is on the north dipping vein, the last one?

A. Yes, upon the north dipping vein, and that the plane of the section is between the two, so there is a slight amount of projection.

Mr. Lindley:

(Q.) You objected to my using the word "forced." I won't use it again.

The Witness: Thank you, Judge. I wanted to explain my conception of it.

Mr. Dickson:

(Q.) I will direct your attention for a moment, Mr. Winchell, to section A on the same exhibit. You have spoken in your testimony thus far of the south dipping and north dipping vein, and the Fraction vein being in places and for a very considerable extent in a homogeneous rock having the same rock for the hanging and foot structure. How is that represented on Section A? Is there any difference there, or intended to be represented, in the character of the foot wall country of those two veins and the hanging wall country?

A. There is a difference; and that difference is indicated upon section A of Exhibit G. The formation is trachyte as a whole. The lower portion of this fomation, as it lies in the ground, has in it evidences of more rapid colling than the upper portion. It has, therefore, been called glassy trachyte, while the upper portion is simply called trachyte. They are both colored violet upon section A of Exhibit G, but small dashes or lines of the same coloring in that portion of the trachyte which underlies the vein represents or indicates that difference.

Q. Now, the Fraction vein, as represented upon that sec-
407 tion, what is its foot *and* hanging?

A. That is entirely in the trachyte, as distinguished from the *gal*ssy trachyte.

Q. How is it with reference to Section "B" on that same exhibit?

A. Section B shows the north dipping vein lying between the trachyte and the glassy trachyte. It shows the main west end vein for a small portion of its extent upon this section, namely, in 500 C stope and raise 569 for a distance of less than 200 feet occupying about the same horizon, but the remainder of the south dipping vein is in the normal trachyte.

Q. And the whole Fraction vein is shown upon that section?

A. And the whole Fraction vein, as shown to a limited extent, is in the upper portion of the trachyte.

Q. Take section C.

A. Section C is through an intermediate portion of the ground running through raise 2 A. Nearer the eastern end than the western end of the west End claim. And here we have rock which has been called West End rhyolite as a foot wall rock and trachyte overlying the veins.

Q. Now, take the upper section, section D, and what is the character of the foot and hanging wall country of both veins as shown upon the plane of the section?

A. Trachyte or altered andesite constitutes the hanging and foot walls of the main west end vein. The south branch, however, for a portion of its distance lies beneath the cap rock.

Q. And in contact with it, practically?

A. Well, there is some brecciation and some doubt about
408 it. There is a small wedge of normal trachyte above the vein at the top of raise 484, between the cap rock and the vein. At some other places it is possible the cap rock lies immediately upon the vein.

Q. Going back to Section A, is the rhyolite shown on that encountered anywhere else on the section?

A. Yes. There is what may be trachyte shown——

Q. Trachyte or rhyolite?

A. West end rhyolite, shown below the Jim Butler winze in a cross cut extended to the north.

Q. And colored on that section?

A. Brown.

Q. Brown. So far as the developments have enabled you to observe what the upper hanging wall and foootwall country of these veins are, what would you say as to whether the greater portion of the south dipping vein, we will say, lies in a homogeneous rock or on a plane of contact between differing rocks, namely, ryholite and trachyte?

409 A. Well, by far the greater portion of this main West End vein lies either entirely in the upper portion of the trachyte, or, in the trachyte near the change which occurs in its lower portion.

Q. Glassy trachyte?

A. What you call glassy trachyte.

Q. A few questions now, Mr. Winchell,—I wish you would indicate, as best you can on the model,—there is some interruption to the line of working,—the course or direction of the apex of the north dipping vein from the west to the east.

Mr. Lindley: The compass course, or general direction?

Mr. Dickson: The course or direction of the apex,—not what the engineers call the strike.

A. No, that is not the strike. I understand you are asking me for the direction of the top of this vein.

Q. The north dipping vein.

A. The north dipping vein, as it is developed in the workings, and as we assume it to be connecting actually developed points?

Q. Yes?

A. The direction of its apex is approximately N. 80 West.

Q. And approximately,—of course you cannot give it accurately,——

A. I have not attempted to measure it accurately, but just with my eye.

Q. And, approximately, what is the course or direction of the top or apex of the south dipping vein at their plane of union?

A. It is nearly east and west.

410 Mr. Lindley: The last portion of your question, Judge, was along the plane of intersection. I did not understand the question. Please read the question.

Mr. Dickson:

Q. What I mean is the approximate course or direction of what the witness claims to be the top or apex of the south dipping vein, he having testified that that is where that vein unites with the north dipping vein. Do you understand, Mr. Winchell?

A. Yes. Nearly east and west. Now, I should like to explain that those two directions do not represent the strike of these veins; that their approximation to coincident is due to the fact that the veins have opposite dips and strike toward each other, and, therefore, regardless of any earth movements, their line of intersection will be a descending line toward the east; this tendency to descend toward the east has been accentuated and increased by small, north and south fractures which have dropped them still further toward the east.

Q. What is the strike proper,—the engineers' strike of the main south dipping vein?

A. It is about North, 70 East.

Q. And what is the strike of the north dipping vein?

A. Oh, approximately, North, 40 West, although both of them are subject to local variations in direction, caused by differences in the dip, caused by differences in the strike, and by faults.

Q. Where, in your opinion, is found the top, or apex, of the south dipping vein?

A. At the point where it meets the north dipping vein. In some cases this is on the foot-wall of the north dipping vein, and
411 in other cases it is within the north dipping vein, because of this easterly movement of which I speak, which has caused the south dipping vein to cut into the north dipping vein like a knife.

Mr. Dickson: I think that is all.

At this time an adjournment was taken until 10 o'clock A. M., December 12, 1914.

412 9.

SATURDAY, December 12th, 1914—10 o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Company.

Mr. Dickson: Mr. Winchell, take the stand. If the Court please, there is one question I want to ask.

Direct examination of HORACE V. WINCHELL, resumed.

Mr. Dickson:

(Q.) I wish you would state to the Court, Mr. Winchell, what, in your opinion, is the process or the agency by which ores are deposited in metalliferous veins, generally; not universally, but the general agency?

A. I think it is generally believed that ores are deposited in veins from solutions which carry the quartz and metallic substances and which follow along channels in the ground, usually in an ascending

direction and by chemical reactions precipitate and deposit the substances which they bear in solution.

Mr. Dickson: You may proceed with the cross-examination. That is all.

413 Cross-examination.

Mr. Lindley:

(Q.) Had you ever had any experience in the Tonopah district before you came to this place for the purpose of examining these mines?

A. I had no extended experience. I had been to Tonopah and in some of the mines before this occasion.

Q. For the purpose of making any critical examinations?

A. Not for the purpose of making critical examinations, but for the purpose of informing myself regarding the general geological conditions.

Q. How extensive has been your investigation with reference to what you call the south vein—south dipping vein?

A. I have examined this vein throughout the openings in the territory shown upon the model, so far as they are accessible.

Q. Have you examined this vein in other territory other than what is shown upon the model?

A. I have not.

Q. Do you know how extensive it is outside of the particular zone in controversy?

A. No, I do not. I do not——

Q. Your testimony and your deductions that you make from your examination are confined in a scientific sense to the immediate area in controversy?

A. They are.

Q. You do not know what character the vein takes in other directions and other places, if it exists in other places?

414 A. No, so far as I am aware there is no extensive development upon the vein outside of this territory. If I had heard that there were, I should have examined it, and I find the developments in the territory in question extensive and sufficiently comprehensive to enable me to arrive at a conclusion regarding its relations.

Q. With reference to the characterization of this vein, I understood you to say that to a certain extent it lay along the planes of contact between two rocks—between rocks of two different periods or two different classes of rocks?

A. It does, and to a larger extent apparently does not.

Q. That is to say, for what fraction of the extension of the vein in this territory is the vein a contact vein?

A. I should say for less than half the distance over which it is developed in this territory.

Q. Then, it lies half as a contact vein and the other half in homogeneous rock?

A. Less than half as a contact, perhaps a little more than half in homogeneous rock.

Q. Not knowing the existence of the vein outside of this particular territory, you do not know whether it continues to be for its greater part a contact vein or not?

A. I do not know, but I should not think that the fact that it might occupy a contact for a very great distance outside of this territory would affect my conclusion that in this territory it is a fissure vein.

Q. Well, now, in the order—in the genetic order, in the order of creation, I understood you to say that the older of the two
415 veins first formed is the south dipping vein?

A. That is my belief.

Q. That is your belief. And at what period of time was that formed with reference to the enclosing rocks, that is, the order of the deposition of the rocks underlying and overlying? In other words, what was the geological condition, the status of that ground at the time the south dipping vein was formed?

416 A. The only thing of which we can be certain in that regard is that the rocks immediately above and below this vein were there at the time that the vein was formed.

Q. Well now when you speak of the formation of the vein, what process do you include from the beginning to the end of its formation?

A. In the first place the fissure was formed by movement of the earth; it is obvious that there must have been rocks in which to form the fissure; in the next place a certain amount of quartz or rather an uncertain amount of quartz, was introduced along this fissure; the fissure was in the trachyte and to a certain extent followed the plane of contact between the trachyte and rhyolite, therefore both of those rocks were present in the ground before the fissure was formed.

Q. What is your idea as to how that fissure was formed, dynamic force or contraction of the rocks?

A. Dynamic force.

Q. In all cases?

A. It is not a contraction fissure.

Q. Well it is the result of some dynamic force?

A. Yes.

Q. And that dynamic force is a sudden rupture, or is it a gradual rupture?

A. It might be either.

Q. What do you consider it in this case?

A. I presume that it was the result of an accumulating stress in the earth.

Q. This particular region has been the scene of intense volcanic activity?

A. Very.

Q. Accompanied by eras of extensive explosions and intrusions of the volcanic flow?

A. We find indications of at least one such volcano in this immediate territory, that which I have mentioned as the Mount Brough-
Dacite breccia.

417 Q. Well, with reference to the different periods of formation of these rocks, is it your idea that there was any considerable lapse of time between the formation of the underlying rock and the next in succession—or were they practically contemporaneous?

A. I think that geologically speaking there was not a great epoch between the different successive volcanic flows, but that in point of time humanly measured there may have been a very great interval.

Q. In other words when we think in terms of geological time we must forget our ordinary thoughts and ordinary time. It that it?

A. Yes.

Q. When you say that one vein was formed and immediately subsequent to it another vein—what do you mean measured in time?

A. I mean without the intervention of any great change, geologically.

Q. When we use the term "immediately subsequent" in ordinary human affairs we have a different idea as to what that means. Can you give us a definite idea as to what you want us to understand by your term "immediately subsequent"?

A. No, sir. I mean as the next immediate event succeeding the event just described.

Q. Well, that may have been a hundred or two hundred thousand years?

A. Might have been a million years.

Q. Then your expression of "immediately subsequent" does not mean anything so far as the measurement of time is concerned?

A. Geologically only.

Q. Geologically only. Now your order of occur-ence after your vein bearing rock was formed, is the creation of the fissure which formed the south dipping vein?

A. Yes, sir.

Q. And that formed the fissure first. When was the process of mineralization complete?

418 A. When was it complete?

Q. When was it commenced and when did it end?

A. That I cannot tell you. It commenced after the formation of the fissure and ended with the cessation of the movement of the mineralizing solutions.

Q. Well, was that a completely formed vein at the time that the north dipping vein was formed, geologically speaking?

A. Yes, I should say that it was, although there was *rp*obably an additional amount of silicification, or possible mineralization deposited in the south dipping vein, at the time of the mineralization of the later north dipping vein.

Q. How are you able to determine that this Fissure vein, this south dipping vein, was mineralized before the other?

A. Because we find the other vein cutting directly across the vein with its continuous mineralization, interrupting the south dipping vein, on its upward course, visible and evidently a later phenomenon.

Q. Might that not have been the result of subsequent readjudtment, or faulting?

A. If it were the result of faulting——

Q. Might it not have been,—can you answer the question?

A. Yes; it might have been.

Q. I do not object to the witness explaining after he answers the question.

A. I will endeavor to do that. It might have been, and I suppose that that is precisely what did happen, that there was faulting, and that along the plane of that fault the north dipping vein was deposited or formed.

Q. In other words your north dipping vein constitutes a later fault fissure?

A. It is a fault vein.

Q. If that true where it lies along the contact?

419 A. There has been movement along the contact but I imagine from what I have seen that that movement is still later and may possibly be going on up to the present time.

420 Q. There are quite marked indications of movement on the walls of this fault?

A. You mean now the north dipping fault vein?

Q. Yes?

A. Yes, there are decided evidences of recent movement along that vein.

Q. Well, when you use the term recent, do you use that in a geological sense or in the modern, the ordinary human sense?

A. Well, I should apply even more closely the idea of time as regarded in human relations to that, because I say there may even be movement along that fault vein lasting down to the present time.

Q. Well, as a matter of fact, the movement is going on continuously, is it not, in the rocks in the mountains?

A. Well, I don't refer to the movement caused by the influence of the sun and the moon; the influence of local surface erosions and readjustments. I mean movements of considerable extent, as one general movement.

Q. Well, now, will you tell us what you mean by movement of considerable extent? Define it in space, if you can.

A. When the frost operates upon the surface of the ground, waters entering the superficial crevices and freezing there, the superficial area is affected. The effect——

Q. In other words, the rocks are disintegrated?

A. The effects of freezing the water is to expand and tear apart small particles of the rock. When the sun thaws that ice, there is a tendency for the surface to creep down hill, for the particles to separate. That is a small movement.

When, as the result of crustal adjustment, there is a move-
421 ment of one large mass of rock upon another, that is a large movement.

Q. That is regardless of the extent of the movement measured upon horizontal or vertical plane?

A. Yes sir.

Q. Then by saying it is a large movement, you do not mean the

removing of one block of rock to any serious distance from its original habitat?

A. No, but a movement extending in general direction over a considerable area, although the distance of the actual movement may be small.

Q. Then, if we were to state that this movement has taken place, and if the movement along this fault vein existed in recent times, would it not displace the cap rocks?

A. Very likely.

Q. Well, wouldn't it be necessarily so?

A. No sir. That depends upon its relation to the cap rock.

Q. And depends upon whether the movement was extensive in direction?

A. That would depend upon whether this fissure enters the cap rock.

Q. Well, along the plane of contact between the two rocks?

A. Yes.

Q. Do you have in mind any particular place where the cap rocks have been displaced by this movement?

A. I think there are very few developments which would make possible a definite reply to that question. I haven't any doubt, however, that if this movement or this fault fissure enters the
422 cap rock, that there has been displacement of the cap rock by it.

Q. Well, if this movement occurred, if the formation of the fissure, the fissure underlying the cap rock, you do not want us to understand that nothing but the fissure movement or nothing but the faulting between the walls moved? Necessarily must it not have been the fact that the cap rock also moved?

A. The cap rock moved, but it must have moved in some direction, and it could not have moved unless there had been some fissure passing into it or underneath it.

Q. Just excuse me a moment.

A. Yes sir.

Q. Mr. Winchell, you are quite efficient in making representations. I am going to ask you to give us the evolution of these veins on a sheet of white paper, if you will kindly do so. Take it in cross section of your plane, of cross section C or B. Inviting your attention to Section B, I have placed on the black board here, Mr. Winchell, an exhibit which we may mark "Winchell X I," and so identify it in the record.

Mr. Dickson: The X standing for cross examination, I suppose?
Mr. Lindley: Yes; *1* for cross examination.

Q. Now, this represents a cross section through the 569 raise and corresponds practically, I understand, to your section B. I would like to have you take a red lead pencil and delineate on that cross section first the quartz or vein in the south dipping vein, as you understand it was originally formed?

A. Judge, I have here a sketch which I made myself of
423 the same raise, the same situation.

Q. You may use that in putting the colors that I am going to designate to you on here. I am going to ask you to first delineate in red the vein occurring in the south dipping fissure and carried up to the point where you say it ceased to be a vein at the time the north dipping vein was formed. Just the quartz in red; not vein matter, quartz.

A. Well, the quartz is very often considered——

Q. Is that a red pencil, Mr. Winchell?

A. That is not a red pencil. It is for my own guidance.

Q. I beg your pardon.

A. I have a red pencil. This is not according to my idea of a cross section of the workings, but I can come approximately.

Q. Now, we are getting first the period of the south dipping vein.

A. I am not very much of an artist, but the quartz of the south dipping vein was deposited in it approximately up to the line which I have indicated on this exhibit, 'Winchell—S. 1.'

Q. Was that all there was in your judgment in the vein at that time, that is, prior to the formation of the north dipping vein?

A. Yes, that is all that there is left of it.

Q. Is it all that there was?

A. Well, I have not expressed any such idea as that. There may have been a segment of it which has been removed, that was above what is now the north dipping vein.

Q. Now, I want you to put that on exactly, in detail, from your notes, that geology at that point; have you put on there all you wish to indicate as quartz?

A. Yes.

Q. As constituting the north dipping vein,—that is on
424 this level?

A. Yes.

Q. The south dipping vein, I mean?

A. Yes.

Q. And what have you to say as to whether that was the terminal edge of that vein at the time the north dipping vein was formed, or whether that vein has still an upward extension?

A. I say that in all probability that this terminal edge was formed by the fissure in which the north dipping vein has, later been deposited.

Q. That is the present termination?

A. It is, and it has been the termination since the formation of the north dipping vein.

Q. I want to know the conditions there as they existed before the north dipping vein?

A. In all probability the south dipping vein extended further upon its course upward towards the north.

Q. Show what you think would be it- probable extension in that direction then?

(Witness indicating.)

Q. The dotted lines there will represent what you think is the probable extension of that vein on its upward course?

A. Yes, practically.

Q. Well, you may go on there and continue with the designation of the quartz, and the details of the geology in the north dipping vein.

Mr. Dickson:

Q. What color are you adopting for that?

A. This is just a boundary line.

Q. What color are you going to adopt for it?

A. He asked me to put on the details of the geology.

Mr. Lindley: We will put on the quartz of the north dipping vein. We will get at the geology in a minute. Put the quartz in
425 in red Mr. Winchell—I want the quartz in red.

A. (Indicating.) That in a general way indicates it.

Q. Now, I wish you would take a blue pencil and mark the gouge on the north dipping vein?

A. You are asking for greater detail than my notes permit me to give with positiveness; the general relations are so evident that I have not taken each inch by itself.

Q. Well, you recall the structural conditions as you have seen them in the ground in that upraise?

A. I do, very well.

Q. Very well.

A. Structural conditions are very well, but each detail as I say is not so very clear. I would like to know where the top of the raise is on this section, how far from this shoulder.

Q. Eighty feet.

Mr. Dickson: What is the scale, gentlemen.

Mr. Lindley: Twenty.

A. Now, does this working here connect with the Tonopah Mining Company?

Q. Yes.

426 Q. Have you delineated now all of the quartz that exists *of* that you believe exists in that cross section?

A. No, there is a little more here (marking same). That represents it substantially in accordance with my notes. We have here additional lines, broken lines, representing quartz that is not there at all, that I put on at your request.

Q. Well, that is the faulted—that is hypothetical in the early stages of the game, showing the formation of the north dipping vein. You may indicate the upward extension there in a black pencil line, and you may mark that A prime and B prime, indicating the probable upward extension of the south dipping vein before it was cut off, as you say, by the north dipping vein?

A. I have so indicated.

Q. Now, you have delineated on the upper part or in the north

dipping vein or on the hanging wall of the north dipping vein two blue lines?

A. Yes sir.

Q. What do those represent?

A. Those indicate the gouge, or a line of clay selvage which is pronounced above the north dipping vein.

Mr. Dickson:

(Q.) Above the north dipping vein?

A. Yes.

Mr. Lindley:

(Q.) Do you understand that the gouge shown in raise 488 by the blue line, as you have indicated, is the same gouge that is shown in raise 537 indicated in blue?

A. I presume it is the same.

Q. That is your understanding?

A. Yes sir.

427 Q. Now, will you just mark by the usual geological designation the enclosing rocks there? I do not mean necessarily the——

Q. You want the colors?

Q. I do not mean necessarily the symbols, for instance, if it was midway andesite, mark it "M A."

A. I do not know what midway andesite is.

Q. Well, what do you call it then?

A. Well, what do you call it?

Q. What are your foot wall rocks? Take it across the cross section B, Mr. Winchell, and put on your designation—instead of dotting, your lines, it takes so long to do that; Section B.

A. The colors probably would——

Q. Very well, take separate colors and then we will get at it that way.

A. I will indicate it green for cap rock over the top of the raise and mark it "Cap." I do not find any purple here. However, I think it will be sufficient to say that except for the green, which I have marked, the surrounding rocks on both sides of the veins above and below, so far as disclosed, are trachyte.

Q. Both of the same age?

A. Yes.

Q. Do you divide that trachyte into—is that a contact vein at this point shown in the cross section?

A. No, it is not.

Q. Are the underlying rocks different from the overlying rocks?

A. They are not different in age, nor in identity, but there is a different phase of a portion of the trachyte which is seen in raise 537 and the level immediately below it.

428 Q. You have glassy trachyte on the foot wall?

A. For a portion of the distance only.

Q. Mark the distance that you have the glassey trachyte on the foot wall there, if you can.

A. I can't tell exactly.

Q. You do not know how far it extends?

A. I do not know how far it extends.

Q. Do you know a point in this section where it does not exist in the foot country?

A. I have not taken this rock beneath the south dipping vein under raise 569 to be glassy trachyte, although there may be a slight shading off, even there. There is no sharp and fast line of separation between the glassy trachyte and the trachyte. The glassly trachyte is assumed to be a cooling phase of trachyte, and it merges from one phase into the other so that you can't draw a sharp line frequently between them.

Q. Did I understand you to say in your direct examination, perhaps I misunderstood you, Mr. Winchell, that some sections of this vein lay on a contact between glassy trachyte and another kind of a trachyte?

A. I said that the two kinds of trachyte seem sometimes to appear, one above and the other below.

Q. As the hanging and foot?

A. Of the vein.

Q. And where they did occur, you call that a contact vein?

A. I did not.

Q. You did not in your direct examination?

A. I said, in the line of contact; that would not make
429 a contact vein.

Q. What is a contact vein.

A. A contact vein is a vein accompanied by contact metamorphism *by contact metamorphism*, in which metamorphic minerals have been deposited; here ordinary vein minerals were deposited and none of the contact minerals have been found.

Q. Well, then, a contact is not a question of physical expression, it involves the idea of the character of the minerals?

A. Very often and to a certain extent necessarily.

Q. Your idea is not that contact vein lies between two different classes of rock?

A. No, that is not a contact vein.

Q. Isn't that what the miners call a contact vein?

A. No, I think not. But even if it does, as I before remarked follow a contact for a certain distance, the fact that it departs from the contact, and cuts through homogeneous rock negatives the idea that it is a contact vein; it is simply a fissure that for a certain distance pursues the line of contact.

Q. Well, that would make it a contact vein then?

A. No, because of the absence of the metamorphism, I have just described to you.

Q. Well, of course, we were not all educated in a geological atmosphere; what I want to ask you is, where in the ordinary common parlance in the mining world—what you understand by the meaning of the word "contact"?

A. Perhaps I should have expressed *by* definition sooner, but if you refer simply to a vein, fissure, or what not, that lies at the

meeting point of two different rocks as a contact vein, then you do not understand the contact vein as I do.

Q. The trouble is that perhaps we do not think in the same atmosphere. I am getting at the term "contact" as used in
430 the common parlance; if you will forget for a moment that you are a geologist and put yourself in the place of a common miner, when a miner defines a contact vein, what does he imply?

A. Ordinarily that he has limestone on one side and an eruptive rock on the other.

Q. He may have different eruptives on two side- and still——

A. He would have to be more than an ordinary miner to know the difference between the two eruptives.

Q. Don't you think that a man working in this camp can tell the difference between the glassy trachyte and the other, to distinguish them?

A. Where the samples are taken at widely separated distances, but not where they shade into each other.

Q. Then you do not want to call this a contact vein at this point?

A. I do not.

Q. In the miner's significance of the term?

A. I do not.

Q. Well, now, with reference to this gouge,—you say that forms a hanging wall of the north dipping fissure, and you have indicated that in blue. There is a dotted red line connecting the 488 with the 537 raise; that indicates the probable quartz extension in those two?

A. Yes.

Q. Should that gouge extension also be dotted in blue?

A. It presumeably extends.

Q. Will you please dot it in blue?

A. Yes.

Q. Now, that is your idea of what happened, and that gouge which you speak of is the result of attrition movement?

A. Yes.

Q. It is a heavy gouge?

A. Persistent, not extraordinarily heavy, but noticeable, and forming a clean separation between the quartz and the over-
431 lying country rock.

Q. Well, how thick is it?

A. Its full thickness may not be entirely exposed, but it is usually only tough—clay for an inch or tow, and the breccia which lies just above it, two or three inches more; altogether not more than six inches.

Q. Well, does the volume of that gouge indicate the extent of the movement?

A. It does not.

Q. It does not necessarily mean that there was a great movement in any particular direction, or it does not necessarily mean that it was a steady grinding?

A. It does not because in this ground there have been a great

many movements at different times, some of those movements have been extensive; I mean now over the whole camp. Some of these movements have been very small; the more extensive movements which were accompanied by the larger amount of attrition movement or gouge in the earlier stages have been followed by silisification which in many instances has obliterated the gouge and turned it into quartz; therefore some of the more recent movement- may have a larger amount of gouge, than far more extensive movements of an earlier period.

Q. I see that you have marked on that diagram a red shade, some heavy and some light. You did not mean to make a distinction?

A. Yes.

Q. What distinction?

A. Heavy quartz as is marked heavy red,—more continuous.

Q. Not any different in character?

A. Yes,—there is a colored quartz found there, some light and some dark and that is different in character.

Q. Well, is there any difference in the character of quartz
432 in these so-called two veins?

A. Oh, yes, there is a difference from place to place in each vein.

Q. Well, I mean by that taking the vein as a whole, do you base your conclusion that this north vein is a separate vein because the character of the quartz is different from the quartz in the other vein?

A. Generally, from a commercial point of view, or as you say that of a common miner, the quartz to the eye appears similar, but there is a far greater amount of mineralization, ore, in the south dipping vein than in the north dipping vein; in that respect the quartz is different, there is a greater thickness of quartz in the south dipping vein than in the north dipping vein.

Q. Is that true all through the two veins?

A. That is true generally. In other words the fissure on one side is larger than on the other and the replacement in one vein has taken place to a larger extent than in the other.

Q. Is there any difference in the vein filling?

A. In the respect of mineralization there is.

433 Q. Well, what is the difference?

A. More ore has been found in the south dipping vein than in the north dipping vein.

Q. Any difference in the character of the mineralization?

A. That I can't say. I think not. Not to the eye. Not any greater difference than might be found between different stopes on the same vein.

Q. Is there any physicial line of demarkation at the point where you say the earlier vein appears up against the later?

A. There is.

Q. What is it?

A. There is a well defined and continuous band of ore which

has a thickness of four inches above the raise 569 and 20 inches in the cross cut extended between 569 and raise 537.

Q. Well, that is the thickness?

A. That is what you asked me, wasn't it?

Q. I asked you if there was any physical distinction. I meant in the line of demarkation. Ordinarily you can tell when one thing ends and another begins, if they are in close contact, can't you?

A. Yes.

Q. Well, how do you tell that the south dipping vein ends along a certain plane and the other begins at a certain plane? What physical evidence of it to the eye of any man mining underground?

A. The evidence is unmistakable and as clear as the meeting point of a window casing *any* the wall. The south dipping vein with its structure, its dark and light quartz, dips towards the south, and following up upon its dip from the south we come
434 abruptly against the north dipping band of quartz which I have described as 4 inches in thickness in the back of raise 569, and 20 inches in thickness in the cross cut which has connected, running through quartz the north dipping vein with the south dipping vein.

Q. Don't they match up pretty closely?

A. Don't which match up?

Q. The two veins as they come together physically?

A. At this point they do not.

Q. Well, do they not generally so?

A. They don't match any closer than a dictionary against a Bible.

Q. Do they not generally match up so it is impossible to distinguish one from the other, except by change in the dip?

A. No sir, it is absolutely impossible to confuse the separation and distinction here. You can't mistake it.

Mr. Dickson:

(Q.) You mean in this particular section?

A. On this section. There are places which I mentioned, where the silicification has been so intense in this wedge of rock between those two veins that it is difficult to ascertain the direction of either vein passing through the large masses of quartz that have been deposited in that vicinity. But some of that quartz was there before the veins were formed.

Mr. Lindley:

(Q.) Now, let us go back to this gouge business a little more. You have indicated there the line of gouge, or what you call the hanging wall of the north dipping vein in blue, a dark blue; that you take as the gouge wall?

A. Yes sir.

435 Q. Have you got any quartz above that wall?

A. There is frequently a little scattered quartz and cal-

cite noticed in the vicinity of that gouge. That is not comparable in any way with either vein, nor resembling it in the character of its deposition.

Q. Well, that upraise does not show any other quartz except the kind of quartz that you have just described after it passes through that blue gouge in raise 537? Does that raise extend up to that red line?

A. Yes.

Q. Now, in the intervening space, you have no quartz except what you have designated on there?

A. That is all highly silicified rock. It is not quartz which is mineralized. It is not quartz which has a definite banded structure, but I would not be at all surprised if there might be some sympathetic quartz stringers passing across that raise in the general direction of the north dipping vein.

Q. That is outside of the vein hanging wall. How about the blue gouge over on the south dipping vein, what is that?

A. There is a wall there which has not nearly as much gouge upon it, which marks, however, the hanging wall of the south dipping vein.

Q. Well, compare the two gouges as to thickness and character?

A. The gouge over the south dipping vein is not clay. It is not tough, it is not so dark colored, it is not so thick, nor so generally in evidence as that over the north dipping vein.

Q. Well, the character of the rocks is the same in which
436 the vein——

A. They are. The character is the same.

Q. Don't gouge take its color from the rocks in which the vein exists?

A. Sometimes. Sometimes it takes it from the quartz which has been crossed.

Q. What is the normal color of quartz?

A. It hasn't any normal color.

Q. What color does it have?

A. All colors. Black, white, red, blue, green, pink.

Q. Well, silica is quartz, isn't it?

A. Crystallized silica is quartz.

Q. And quartz is crystallized silica?

A. Yes.

Q. And if there is a change in color, it is due to the injection of some other mineral?

A. The inclusions of some mineral, or of gases or bubbles.

Q. But when you now say that while these veins at this particular locality are precisely in the same rocks, each having the same kind of gouge, with regard to the general proposition the one has a different color from the other, is that correct?

A. I did not answer you quite fairly. I think that quartz is more frequently light colored than dark. I do not want to be captious about this at all, but there are enormous deposits of quartz in which there is no light colored quartz at all, and in referring to the color of

quartz, I am quite right in saying that it may be any color, but it is more frequently light colored than dark.

Now, as to this gouge, I think the gouge, so far as there is
437 any over the south vein is apt to be of both light and dark colors, but it is not so thick. It has not the same tough clay selvage as that which is generally found lying over the north dipping vein.

Q. Well now, you speak of this north dipping vein, is that the result of a fault? You say it is the result of movement creating the fissure?

A. I consider it a fault fissure vein along which there has been some replacement of the country rock, and the fragment- of which country rock originally lying within it have been entirely silicified and turned into quartz.

Q. What kind of a fault was it?

A. That I don't know.

Q. A normal or a reverse fault?

A. I don't know.

Q. You were not interested in endeavoring to find out?

A. Oh, yes, I was.

Q. And you could not find out?

A. I did not.

Q. Were there any striations or grooving to indicate the line of movement?

A. Beautiful ones, and they are later.

Q. They are later?

A. Yes sir, later than the formation of the original fissure in which the vein has been deposited.

Q. So all evidences of original striations, if there were any, are eliminated by a later movement?

A. Yes. When one later movement takes place, it is very apt to disguise or obliterate the evidences as to the earlier movements.

438 Q. Then there is nothing in the ground by which you could tell whether this is a reverse fault or a normal fault?

A. I don't know.

Q. Have you made any investigations for the purpose of determining, or didn't you think it was important?

A. I have, but I have not been able to ascertain.

Q. Do you think it important to ascertain?

A. No, I do not think it is specially important.

Q. Well, if it had been a normal fault, what would become of this segement of the vein that you have dotted there extending out into the North?

A. It would have gone a greater or less distance down upon the hanging wall.

Q. And would have been found out somewhere in the north, if the north was there, that is, if the rocks were still in place?

A. If the rocks were there.

Q. If that was not a normal fault, that vein was thrown down to the north and has since been eroded, is that your idea?

A. It was eroded probably before the laying down of the cap.

There is a small amount of trachyte resting above the north dipping vein, but not a great thickness, and whatever segement might originally have been there it must now be reduced to a very short stub.

Q. Suppose the fault was the other way, what would become of that segement of the vein?

A. If it had moved far enough, it would be in that region which has been entirely eroded.

Q. In other words, whichever way it was faulted, normal or reverse, it is all gone by your subsequent erosion?

A. There may be a small stub of it farther down around
439 the dip of the north vein, but there is none of it left south of the top of the south dipping vein.

Q. Wouldn't it be a likely thing for people to do if that was a faulted vein, for the miners to try and find it?

A. I should think so if there was any prospect of finding any considerable amount of quartz. But it is also true that there hav-n't been any workings made with sufficient diligence to disclose a small extension of that vein, if it occurs in this ground, and knowing that the cap comes down so close, I should not think it a good prospective piece of work to look for it.

Q. So you are not able to tell whether this is a normal fault or a reverse fault?

A. No, sir.

Q. There are no indicia in the ground by which you can tell, and there is no method of determining the extent of the movement?

A. Well, I am not prepared to say that other more skillful geologists might not determine; might not find indications of the direction of the movement, might not even find something to determine the extent of the movement, but I have not been able to find it.

Q. Well, you have made an earnest effort to do it?

A. I have endeavored to interpret all of the geological phenomena which I found in this ground, to explain the fact, but I have not been able to ascertain the direction or the extent of the movement, along the north dipping fault vein.

Q. And according to your notion it was not necessary for you to determine whether this was a normal or a reverse fault, in order to reach a conclusion as to the conditions there, the geological conditions?

A. It was not. The geological conditions are as plain as day.

440 Q. And it was not necessary for you to account for the method of that fault in reaching any of your conclusions, as to whether it was a reverse or normal fault.

A. It was not.

Q. You are quite positive of that?

A. That is my opinion.

Q. Are there any other faults in this section of the mine; shown in this neighborhood?

A. There have been a great many small faults, an innumerable number of them. The ground is cracked and faulted in various directions. I have already referred to the fact that before the for-

mation of these veins, there are indication- of north and south breaks, along which extensive silicification occurred.

Q. Well, anything which you might put in the category of major faults?

A. No, sir, I have already mentioned the indications of a movement, recent movement, after the formation of the north vein above the south vein, towards the east, which caused the south—the upper edge of the south vein to protrude into the quartz that had been deposited before that movement occurred in the north dipping vein.

Q. I am now going to show you two samples. I think that you testified that the south vein dips into the north vein like a knife edge?

A. Yes, sir.

Q. Will you explain that?

A. I say that it projects into the north vein quartz, having actually cut into it by movements which are registered in the shape of groovings over the hanging wall of the north vein. These groovings run nearly east and west and lie nearly horizontal, and it has—wherever the south vein has been sufficiently resistant and solid—it has cut into the quartz of the north dipping vein, so that at some points it nearly reaches the hanging wall of that north dipping vein.

441 Q. The mark made upon the north vein by the south vein was made in the vein matter of the former?

A. Yes, sir.

Q. This vein matter was marked or grooved by the movement of one vein butting against the other and most have been deposited before this movement occurred?

A. Yes sir.

Q. Is there any mineralization of the surface of the groove or furrow formed by the north vein on the south vein?

A. That is quite a recent movement. There has not been any deposition of quartz there. There is sometimes a little calcite.

Q. Can you answer that question categorically? Is there any mineralization of the surface of the groove or furrow formed upon the north vein by the south vein?

A. What do you mean by mineralization?

Q. What do you mean by it?

A. I shall have to ask you to define it before I could answer the question.

Q. Define it as to your conception, what you term the mineralization.

A. It means two things. The miner means the deposition of something valuable. The geologist means the deposition of any kind of mineral.

Q. Now, can you divide the question and put it hypothetically from the standpoint first of a geologist and then from the standpoint of a miner. We will get it both ways.

Q. We have along the grooves the formation of smooth slickensided surfaces which are arranged—in which the particles
442 of mineral are arranged in one direction rather than in a

cross direction; arranged in the direction of the movement. And sometimes mineralization is a mechanical process. In the sense in which mineral might be deposited in a certain spot by mechanical processes in combination with chemical processes we frequently have a mineralization.

From the miner's view, I haven't seen anything which would lead the prospector to drive in that direction with the idea of finding ore.

Q. Well, as a matter of fact, before the advent of the geologists and the experts, a miner mined this wherever it was mined, practically one vein, didn't he?

A. Yes, he overlooked some pretty good ore up in the raises up above the south dipping vein.

Q. Now, let *up* parenthetically depart from that. You said there is some ore in what dipping vein? South dipping vein?

A. In the north dipping vein there above the south dipping vein.

Q. Where?

A. Raise 4 A and 5 A.

Q. How far up the raise?

443 A. Forty or fifty feet.

Q. How do you know that it is good milling ore?

A. You can see the silver in it, the silver sulphides.

Q. How much of a stope is there there?

A. There is not any stope.

Q. How much of an ore body is there there?

A. Two or three feet in places.

Q. How long?

A. I don't know, only shown in the raise.

Q. What right have you to say that there is a large body?

A. I did not.

Q. What did you say?

A. I said that he overlooked some good ore.

Q. That might have been a thousand pounds or fifty?

A. Yes, but it is enough to lead a prospector to do some work, rather than following the little clay gouge; it is ore.

Q. Yes, but in order to get ore you would have to drift up through barren quartz fifty feet?

A. No.

Q. Or what would you go up on?

A. On good quartz, but not so rich as some higher up.

Q. The fact is that you did not go up in the 5-A raise on anything?

A. I have heard it testified here that the 5-A raise was driven before this litigation started.

Q. You know that there is no stoping done there?

A. There is no stopeing here.

Q. That as a matter of fact that 5-A raise was there when you came to the mine?

A. Yes.

Q. These other raises were put up subsequently?

A. 488; 2-A; 5-A; 6-A and 7-A were all there at the time of my

first examination, probably last April; they have been extended some since them,—I don't know how much; I think 488 is sub-
444 stantially as high as it was at that time.

Q. These raises are litigation raises all except 5-A,—that is to say they were not done in the ordinary process of mining?

A. No, they were made for the purpose of developing the geological conditions in the mine.

Q. Does not it appear to you that *there* are pretty close together for mining operations?

A. Rather close together for mining operations; they were probably and presumably multiplied in number because it was easy to anticipate that our friends on the other side would say only 'one raise up there' do you think that demonstrates anything?

Q. Well, a drift from the raise would have been much cheaper than five or six raises?

A. No, a drift would not have served the purpose; each raise carries the vein to this cap, and a drift along that cap might not have been a drift at all; it might have been a series of raises and inclines.

Q. Well, it is conceded I suppose that these raises were made for the purpose of this litigation?

Mr. Dickson: That may be admitted.

A. I so understand it.

Mr. Lindley:

Q. And for the purpose of locating the apex or top of these veins, you have there on the model a series of finger-like projections to indicate the raises?

A. Oh, to make it possible to ascertain underground, the precise condition of affairs.

Q. And for that purpose you think that many raises were
445 necessary?

A. No, I did not have anything to do with the putting up of these raises.

Q. Were you not consulted about them?

A. No, they were put up before I got here.

Q. All of them?

A. All but 4-A and raise-A.

Q. You were not consulted about it; that is not your plan of development?

A. I am not the guilty party.

Q. Well, now, let us talk a little about these rocks.

Mr. Lindley: I would like to have these two specimens marked, Mr. Clerk. Have you got a sticker to put on them? We may label them someway or another so that you may label them afterwards.

(Samples marked.)

Q. Now, Mr. Winchell, I am showing you two samples of rock one marked "Win. X-2" and one marked "Win. X-3" and I will ask you if you can tell what,—taking one at a time, taking them in the order of their numbering,—"Win. X-2."

A. Tell what they are?

Q. Yes.

A. Ordinarily I would not undertake to determine from the inspection of a hand sample the species or name of rocks in this camp, when I find that the most experienced students of the camp, geologists changed to their nomenclature and determination two or three times in the course of ten years, after the most exhaustive investigation, and I do not feel a great deal of confidence in my own determination. However, I should presume and provisionally classify (Win.-X-*a*) as glassy trachyte, and (Win.-X-3) as trachyte not very far removed from the glassy trachyte in place underground, and still containing some of the glassy trachyte structure.

446 Q. Well there is no serious difficulty in distinguishing those rocks apart?

A. No, they have not a precisely similar appearance, but yet belong to the same time of rock, and I believe both occurred here at the same period of time.

Q. Is not the glassy trachyte as it is found in this camp, nonproductive, so far as mineral is concerned, in this camp?

A. Generally I think that is true.

Q. That is true?

A. Generally, but there might be found veins within it.

Q. Well, so far as your observation shows, you have not found any?

A. I have not.

Q. The Mizpah trachyte is locally known as the lode prophyry isn't it?

A. Do you call this "Winchell No. 3" Mizpah trachyte, what I call trachyte,—you call Mizpah trachyte?

Q. Yes.

A. I understand that is the formation in which the most productive veins have been found.

Q. Is there any glassy trachyte on the hanging wall side of this vein?

A. I haven't observed any.

Q. Well, you would conclude from that that there is none?

A. Yes,—well, I could not say positively, but I have not observed it, and I have seen the openings that have been made; in a district where rocks have not only been intruded into each other, and poured over each other, and faulted up against each other, and have been of different periods, it would be unsafe for anyone to dogmatize and say, that one rock could not be found at any elevation in the ground.

Q. Well, as far as your experience goes, and I understand that you have made a very careful study of these veins,—you

447 have not seen any in the glassy trachyte?

A. That is true.

Q. You would not want to pass any opinion on what might have occurred,——

A. I am simply trying to be guarded as a prudent man should against making certain and positive statements.

Q. Well, of course all latitude is always allowed to a scientific

witness. Does not the quartz shown on your sketch at B,—I have put two marks on here indicating "X-Y." I will reframe the question. Does the quartz shown in your sketch at Y—

448 Does not the quartz as shown on your sketch at Y, which you say is in the north vein, correspond better in dip with quartz at X, which you say is in the south vein, that it does with quartz in raise 488?

A. I don't think it corresponds in dip with either. I think this is a crosscut made through quartz which has a north and south vertical structure.

Q. Where a vein is flat, the structure is vertical as a rule; where the north and south dipping vein, there would be the place where the vein would be practically horizontal with a vertical dip?

A. Yes.

Q. If it has any vertical dip?

A. If the vein is horizontal the dip is horizontal.

Q. Where the quartz would stand, so far as the eye is concerned, vertically?

A. Where there are evidences of actual vertical structure, not horizontal structure; but this quartz lies,——

Mr. Dickson (int.):

Q. Identify the place you are referring to.

A. This quartz at Y and "Winchell X 1" has very little structure; at different parts of that crosscut you can see a vertical structure and east dipping structure, and flat structure, and north structure.

Q. You have a combination there?

A. You can frequently find that; you frequently find the evidences, indications of the formation of this north dipping vein even below the top of the south dipping vein in the shape of cross-fractures in which a little quartz has been deposited.

449 Q. Does not the quartz at Y follow directly the quartz at X?

A. Yes, so it does up and down. The working might have been made a raise, a vertical raise here in the quartz which has been deposited in the wedge of rock between the two veins.

Q. Was there not a definite ore streak followed by the miners of the West End mine from X to Y when they drove the opening?

A. I think there is some ore in there, but I don't think it is a definite ore streak, although there are places in which this apex or wedge of rock underneath the two veins has been fractured in various directions and quartz deposited in it, so there might be definite streaks running in different directions there.

Q. Isn't it true that the zone between the two, between the south dipping and north dipping veins, is mineralized?

A. Some of it is good looking quartz and other portions of it seem to be absolutely barren, bony quartz.

Q. Now, I wish to take you to cross-section here, raise 573; will you kindly repeat the matter there that you have on the other raise?

A. This section is not complete; there are two raises in the same plane, 461 and a little raise under it, which do not show upon this.

Q. Can you put them on there? I suppose that was the condition when the section was made. Mark it "Winchell X4."

A. Will you have one of your draftsmen complete this section?

Q. Well, that is an exact section. We have not put anything on that that is not in that section. Can you from your notes put in what is in that section? That is an exact section.

450 A. You wish me to call all the quartz red?

Q. Yes. You are extending the quartz above the section?

A. There is a section within 5 feet that shows it extending on up there for 40 feet.

Q. Well, I will ask you Mr. Winchell,—this is an exact section. We have not put anything in there that is not cut on the plane of this section. I do not want to mislead you at all. If you will simply make the explanation that that is shown in this section and is so and so, and that 5 feet away this other occurrence is also so and so,——

A. Do you object to my drawing the red line beyond?

Q. I do not object if you explain that that is not in the plane of the section, but 5 feet away from it.

A. It is in exactly the top of the raise. I do not want to place anything here that you do not want. The bottom of the raise is within 5 feet. I see the raise inclines away from the section upward on its dip; the raise was put up as near as possible to this section and yet not break down the intervening material.

Q. Was that a diagonal raise?

A. It was put up upon the dip and at its top breaks into another raise which is also very near this plane of section, and the two together give a more complete view of the conditions in the ground, as I have them on my sketch.

Q. Will you kindly put everything in quartz into the plane of that section and then if you want to say it is at a certain distance from this section that this occurs and that you are justified in putting it on the plane of this section marked "Winchell X4",——

A. (Indicating.) That is approximately the representation of this section.

451 Q. The red marks, above the line in the section, indicate what?

A. The red lines above the outline of the opening as shown upon the section, indicate quartz which is seen projecting into that drift from the side of the opening, and the two uppermost lines represent quartz which is seen in the raise a short distance to the west of the plane of section, as well.

Q. Well, how far west?

A. I should say 15 feet, at a guess.

Q. Well, they are not seen in the plane of the section?

A. They are seen projecting into the top of the opening behind the plane of section. If you do not wish them extended so far I will erase them.

Q. Oh no, no; I don't care. I just wish to know,—I know they are not on the plane of section.

A. No, they are there. They are on the plane of section.

Q. It would seem that that quartz from right to left, or from north to south, followed over without any serious interruption in that section.

A. There is more quartz which you have not permitted me to put on.

452 Q. Oh, I thought that you had finished.

A. There is lots of quartz below; I cannot say how far, but there is quartz in the floor,—but that is not necessarily all of the quartz.

Q. Put on all the quartz that you have in your notes, that you think is there?

A. Well, there is some quartz in the floor, and in answering your question I may say that the cross-cut extending from intermediate 421, marked "I-421" to the northern or lower end of raise 573, which we call "winze 573"—marked "W-573"—is similar in character to the quartz which is found in the ground beneath the two vein-, and shown upon "Win. X-1."

Q. Well, the addition of that other quartz, which you state was there below the sketch or black line of the sketch, does not change the situation any does it?

A. I do not know how far down to put it; that is not shown on the precise plane of the section.

Q. Is it shown on the floor of the winze or the raise or drift—whatever you call it——

A. Yes.

Q. Of the opening?

A. Yes.

453 Q. Now, will you take those two sections and point them out on the model, approximately where they are so the Court can have them in its mind?

A. I would like to call your attention to the way in which the south dipping vein in its upward course toward the north lies against the foot wall of the north dipping vein in this section, and explain that there is a thickness there of 5 feet of the north dipping vein, and the south dipping vein is plainly shown terminating against the foot wall.

Q. Before you leave this section: let me understand what you meant when you say that? At what point does this south dipping vein terminate against the foot wall of the north dipping vein?

A. In drift 461.

Q. Mark that with something so I can identify it.

(Witness does so.)

Q. Do you call that the foot wall of the north dipping vein?

A. That is the foot wall of the north dipping vein, and there has been quartz deposited below it, probably in connection with the shattered condition of the rock which might well be included within it. But this marks the actual top of the south dipping vein at that point.

Q. Is there any ore in that quartz lying underneath what you call the footwall of the north dipping vein?

A. There has been ore deposited in connection with the mineralization of the north dipping vein.

Q. Where did that mineralization come from, the north or the south dipping vein?

454 A. Came from the later north dipping vein.

Q. All of it?

Mr. Dickson:

(Q.) At that particular place?

A. I understand he is referring to this particular section.

Mr. Lindley:

(Q.) Yes. How do you know?

A. I don't know. That is my impression. That is my belief. I can not tell you how absolutely certain anybody can be regarding the origin of these veins and their succession. I am giving you my best belief in the matter.

Q. Well, I understood you to state it as a positive fact; that is the reason I asked the question.

A. All of these statements, except as to actual matters of fact, are conclusions.

Q. Opinions?

A. Opinions based upon the facts observed in the ground.

Q. Now, if you will, point out to the Court these two sections that we have been discussing here on the model, so that he will know where we are.

A. Raise 569 and raise 488 above it are shown upon the model, just west of the east end line of the west end claim. They illustrate in the coloring the south dipping vein coming up to the foot wall of the north dipping vein, and show the north dipping vein extending upward into raise 488 and downward into raise or winze 537.

Q. And that is the locality where the cross section is taken. And the next one——

A. "Winchell X I." "Winchell X 4" is a section of the raise 573 which comes out of the top of 500 C stope, and is extended upon the south dipping vein until it encounters the north dipping vein

455 in winze 573 and shows it in upraise 461, which is just west of the plane of section.

There is one thing which could not be shown upon the section "Winchell X 4" and that is a little fault whose direction is about north 30 degrees east, which crosses the lower end of winze 573 and displaces some of the quartz which is seen there, and shows that the quartz is not entirely homogeneous but that there are portions of it more completely—more solid and massive than other portions. That fault is shown upon the model, but could not be shown upon the section because it lies nearly in the plane of the section.

Q. To what extent is the ground dislocated, the vein dislocated at that point?

A. At one place there appears to be a dislocation of a massive portion of the vein of about 5 feet, which brings a less completely silicified portion of the vein opposite the solid quartz.

Q. Well, that is an occurrence down there similar to what you say occurred up in the neighborhood of the junction of these two veins?

A. Well, no, this is a later fault.

Q. Well, I mean similar as to process?

A. This is a later fault. There has not been any quartz deposited along this fault that I have observed.

Q. You do not think, then, that the conditions shown in the neighborhood of that particular fault you have just testified to are parellel at all along the line of the intersection between these other two veins with reference to silicification?

456 A. No sir.

Q. Is there any displacement there which indicates the extent of the displacement on that fault plane?

A. Yes. I have already answered that question; I stated that there appeared to be a displacement of about 5 feet, which brought a portion of the solid quartz up opposite vein material which is not so completely silicified.

Q. Then, that indicates that they are of a different origin as to period? The more highly silicified quartz formed at one time, and the other part of the fault at another?

A. No.

Q. What does it indicate? Please explain it?

A. That indicated that the ground was unevenly impregnated with quartz, and at that point we have a portion of the solid quartz brought up against that which was not completely turned into quartz.

Q. Just as a matter of coincidence at that point, the line of demarkation occurred? That is to say, the difference in character of the structure?

A. It occurred there because there was a fault there which shows the difference on the two sides.

Q. Was that a pre-mineral or a post-mineral fault?

A. That is a post-mineral fault.

Q. Then, you do not understand if you should place the parts as they were originally that there would be any change in the structure? If you put that back, the dislocated part, unite the two, there would be any difference in the structure? The difference would still be observable?

457 A. The difference would still be observable; instead of being in a horizontal direction, it would be in a vertical direction.

Q. The difference in structure would still be observable?

A. That is due to the difference in the degree of silicification.

Q. It was a part of the same thing at that time, according to your judgment?

A. Yes sir.

Q. And the mineralization was here faulted?

A. Yes sir.

Q. What produced the difference in structure that exists now?

A. The difference in solubility of the rock which has been re-

placed by the quartz. The difference in the amount of the crushing which it had sustained.

Q. In other words, what was the same thing, the same general composition at one time has been changed and modified by subsequent movement and subsequent action of different kinds?

A. We find throughout all of these veins quartz which is completely crystallized. We find other portions of the veins which contain fragments of the country rock turned into lighter or darker colored quartz, but with the rock texture still observable. And we find in still other places fragments of country rock included in the vein which is but little silicified. That enables us to perceive a gradation in the extent of the quartz deposition.

458 Q. Well, that is a very interesting explanation, but I am not sure that I have made myself clear; if you will permit me to just go over that question just once more; if you will permit me to give you an illustration in a crude sort of a way, because I do not profess to be a scientific man, Mr. Winchell. I have here a section of vein—we will mark this, if you please, "Winchell X 5"—which was formed at the same time under the same conditions, it is impressed with the same indicia and has the same characteristics as to structure and as to component matter generally. That is your idea as to the original condition of that vein at that point that you just testified to in that raise, is that correct, where that fault is? That was the original condition of homogeneous, the same character of filling of the vein?

A. No sir, I said it was not.

Q. Not in the original instance?

A. No, there were different degrees of silicification of the material included in the original vein.

Q. And the fault line——

A. It was all vein.

Q. It was all vein?

A. But some of it was harder quartz than others. And at this particular point there has been a little faulting, which brings some of that hard quartz against some of the less completely silicified vein matter.

Q. Then, you did not intend to say that the faulting of that vein so that a part of it was thrown down has changed the structure, or did you?

A. No, I did not.

459 Q. It is the same thing precisely as it was when it was in its original position, so far as structure and quality and mineral aggregations, or whatever you might call them, the same thing?

A. Yes, I see no indications of mineralization later than that fault to which I referred.

Q. Then, the faulted segment, if put back in its original place, would match directly up with it, and show the original condition?

A. I presume so.

Q. You presume so?

A. Yes sir.

Q. Then, that was simply a mere coincidence, then, that the fault

happened just at that place where there was a line of demarkation between the character of the quartz?

A. No, there was not a line of demarkation. The line of demarkation was made by the fault.

Q. Then, you could not tell the lower part from the upper part before the fault was made?

A. Probably not.

Mr. Lindley: I misunderstood your explanation, then. Put a rubber band around that, and mark that "Five X."

Mr. Alling: Judge Lindley, for my own information, this has all been about this little fault out here at right angles to the axis of the so-called roll, has it not?

Mr. Lindley: That is where he said there was a displacement which is not shown on the model, but which he recalled as being about how far?

The Witness: About 5 feet. It is not a displacement of
460 the entire vein. It is a displacement which marks the moving of one part of the vein up or down against another portion of the same vein.

Q. Well, you mean by that, that the displacement did not extend clear across the vein?

A. No, I do not mean that. I mean that the vein was not moved along the fault far enough to displace it entirely. The fault passed through the vein.

Q. Is that on account of the width of the vein?

A. Yes sir.

Q. Then, the movement was not as great as the width of the vein?

A. It was not. That is a better way to put it.

Mr. Lindley: Well, I think perhaps if it is the pleasure of the Court, we will adjourn. I think that I am pretty nearly through with Mr. Winchell.

Mr. Dickson: If you do not object, lest we forget, I want to make a general offer in evidence of all our exhibits, all our maps.

Mr. Lindley: That goes without saying, certainly. We consider that whenever a witness is examined and an exhibit of any kind is identified by the witness, it is considered to be in evidence in connection with the testimony of the witness, and that may extend through the trial.

Mr. Dickson: Very well.

The Court: This case is continued until 2 o'clock this afternoon.

461 December 12th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

HORACE V. WINCHELL on the stand for further cross-examination.

Mr. Lindley:

Q. Mr. Winchell, I am going to ask you to be kind enough to

give us your understanding of the occurrences in the cross cut, which is on the blackboard, marked "Win. X-6"; that purports to be a cross section through that portion of the mine which has the stopes at the west end of the property, in the neighborhood of Raise-A; can you identify the workings that are marked there on that "Winchell No. 6."

A. Raise-A, I take it does not show on the section.

Q. No. In other words I understand it that there is nothing shown on that section, but actually occurred in the plane of the section,—it does show, yes. The 200 Raise is identical with it?

A. Yes, but Raise-B does not show on it.

Q. That is a vertical raise?

A. Yes.

Q. Well, if Raise-B is essential later on to help you out any you may indicate that on there, but I would like for you to give me now the quartz occurring in that roll, or juncture of the two veins, as you call it, and roll as I call it; just take your lead pencil and give us the quartz?

A. May I ask you if this little working indicated by the letters R. S. E. is Raise 132? It is not numbered here.

Q. I think that is the raise, is it not Mr. Finch?

Mr. Finch: Yes.

462 Mr. Lindley:

Q. You can mark it on there to identify it.

A. It is not necessary as long as I understand it. It is not an easy matter to construct a section off-hand like this but I will do the best that I can.

Q. Well, you are quite familiar with that ground, are you not?

A. I am familiar with the workings that are open, yes.

Q. That has been quite a battle ground in this case, has it not?

A. Yes.

Q. Therefore you have made more especial study of it?

A. I have. I should say that that represents in general the situation (indicating). The section is taken diagonally through the strike of one of the veins and nearly on the dip of the other, consequently they cannot both be represented in their true relations. The A-raise shows the hanging wall of the north dipping vein throughout, and therefore must show it where intercepted by this line of section. Raise-152 starts upward upon the vein but does not follow the vein to its top, because it enters the cap and I am not quite certain whether at this particular plane of section the quartz shows at the bottom of raise 152, or not.

Q. May I ask you at this juncture whether you think the vein exposed in Raise-A is also exposed in Raise 152?

A. It is possibly, although I am not sure of that; the cap shows in that raise and underneath the cap is a little quartz. The raise upon this section should be marked mostly in green as I have now indicated, marking the cap.

Q. Well, I understand that you don't wish to determine now

whether raise-A will show the same condition when it reaches, if it does reach raise 152?

463 A. I do not know.

Q. What is your view about it?

A. Well in a country so full of faults, faults so numerous as they are in the vicinity of this cap, I should not like to express an opinion.

464 Q. Now, have you omitted anything from this section, Mr. Winchell, that was not put on there that was put on the other section in reference to the designation of walls, gouge and things of that kind?

A. No, I think not.

Q. How about the gouge on the south dipping vein in this section?

A. There is not a very good gouge there. In fact, it is less noticeable there than usually over the south dipping vein.

Q. Did you observe any gouge there at all?

A. That is at the top of a st*poe*——

Q. May you not answer the question categorically and then explain?

A. Pardon me. I do not recall observing any gouge there.

Q. Well, do you find any similar conditions there as to structure, anything parallel to the conditions down in these cross sections that were represented by Winchell 1 and 4—Winchell's cross?

A. Yes, we observe the hanging wall of the north dipping vein continues along the top of the stope of the north dipping vein, and extending upward beyond it, and shown in A raise.

Q. But you have shown a gouge, hanging wall in the other two sections in the south dipping vein?

A. I have already explained that sometimes that wall is to be seen and other times it is not noticeable. That the hanging wall of the south dipping vein is sometimes quite completely cemented by silica.

465 Q. Is there any defined foot wall shown in raise A?

A. No.

Q. What do you conceive to be the character of the material underneath the bottom of raise A, between that and the top of the West End—top of raise shown on the south dipping vein?

A. I believe that to be trachyte.

Q. Unmineralized, either geologically or in a miner's sense?

A. Probably considerably silicified.

Q. Well, when you use that——

A. I do not call it mineralized in the sense that it has ore in it.

Q. In the geological sense, is it mineralized?

A. It is silicified, yes.

Q. But not in a miner's sense?

A. Not in a miner's sense.

Q. When you speak of the mineralization, almost everything is mineral, isn't it, that exists, either in the air or in the earth or underneath it?

A. Well, any inorganic substance may be mineral.

Q. Well, water is a mineral, isn't it?

A. Yes.
Q. So is petroleum?
A. It is.
Q. So is gas?
A. Yes sir.
Q. When you speak of the term mineralization with reference to these veins——
A. Some kinds of gases are mineral. Excuse me.
Q. That depends upon their original source. Is that what you have reference to?
466 A. No, meant that there are some organic gases.
Q. Well, have you examined the intervening territory there between the bottom of raise A and the raise going up on the south dipping vein to determine whether it is ore, or whether it is mineralized in the miner's sense?
A. It is not accessible. Not been opened up by development.
Q. Then, you do not know?
A. You asked me my opinion and I gave it to you as probably trachyte.
Q. Of course, you can not see any further than any one else can up against the rock?
A. I thought if I had said that first you would ask me for my opinion. Therefore I gave it to you first.
Q. There is no development there to show what is below the bottom of that A raise, is there?
A. I think not.
Q. And there is no hanging wall developed from the raise on the south dipping vein?

Mr. Dickson: You say below the bottom of A raise. The bottom of the raise goes into the stope.
Mr. Lindley: The bottom of the raise—the raise would have a top and bottom. The top of the raise is indicated by a gouge line indicated in blue. The bottom of your raise is indicated in quartz.
Mr. Dickson: I see what you mean.

Mr. Lindley:

(Q.) Now, the bottom of that raise is not along a wall?
A. No, it is not.
Q. What you have designated as quartz?
A. It is in quartz.
467 Q. You do not know how far below that quartz extends, as a matter of fact?
A. I do not, but I have never seen the north dipping vein of very great thickness, and in order to extend all the way downward to the south dipping vein at this point, it would have to have a thickness of more than 20 feet, more than possibly 30 feet.
Q. Are there not some stopes in the mine that are that width?
A. On the south dipping vein, there are.
Q. What is the maximum width of the stopes in the north dipping vein? You have not observed, I suppose, all the stopes that have been made in that vein?

A. No, I have not.

Q. Well, from your experience, what is it?

A. 6, 7 feet. The maximum, I should say, was not over 8 feet in thickness.

Q. Well, you think that the variation in size of the stopes, then, is indicative of different origin and different vein?

A. To a certain extent.

Q. To a certain extent. Now, with reference to this upraise, I think it is 195, isn't it? Is that the way you identified that raise, 195—supposing you should determine that raise A followed over and connected with, in the same class of material which is shown in the cross section, with raise 152; that is the raise 152?

A. This is 152.

Q. Yes. And the drift from the top of the raise. Suppose it should be shown that what is stoped in raise A connects with, and has developed in raise 152. Would that be at all significant
468 of anything, in your judgment?

A. It would not be at all significant of any facts which would change my opinion, that I have already expressed, in the least.

Q. Then, you think it is entirely immaterial?

A. I think it quite likely that the quartz found in raise A may extend a little farther until it lies under the contact of the cap in raise 152, at a still higher distance above the south dipping vein.

Q. That raise A down as far as the gouge seen might be traced?

A. No, the hanging wall is visible in the top of the raise.

Q. That is to say, from your observation there that gouge extends further into the hanging, further to the south?

A. I think it does, yes.

Q. Pretty close to the cap rock there?

A. Yes, sir.

Q. Do you understand, Mr. Winchell, that there is a difference between a miner's vein and a geologist's vein?

A. Well, miners have a very varied conception of what is a vein. I have seen many a miner locate an aplite dike for vein. I think that the ordinary conception of a vein is understood by both. I should say that the proper conception of a vein, whether miners' or geologists', is a deposit of mineral, or mineral bearing rock within boundaries, in place, and possessing such indications of value as to justify the miner in following it in the pursuit of ore.

469 Q. Speaking of boundaries, do you mean physical lines of demarcation?

A. Not necessarily.

Q. They may fade out into country rock?

A. Well, boundaries, may be commercial or physical as well as——

Q. That may be determined by an assay value?

A. It may be, but the boundary must be there.

Q. Well, we may draw a distinction mentally I suppose, between a physical line of demarcation as a gouge wall and a fading of values into the country rock?

A. I think so, yes.

Q. Wall boundary, the vein boundary, the vein limitations would be the limit of pay values?

A. It is often in veins which I have seen.

Q. Consequently when you speak of boundaries you do not mean necessarily physical boundaries?

A. No, I do not.

Q. Now we have discussed to some extent in this case the Fraction vein and what we call the south branch of the south vein. Are either of those veins,—are there any occurrences exhibited on those two veins,—let us take up the Fraction first, if you please, that are essential at all for the determination of any of the facts in this case?

A. Not essential, but having a side light upon the nature of the south dipping vein, as to whether it is a contact vein, as you have called it, or a fissure vein.

Q. Well, all the veins involved in this controversy are classified by you as fissure veins?

A. They are.

Q. And why should there be any distinction, as far as that is concerned, in the Fraction vein and the other veins; I am
470 anxious to get from you if you feel disposed to tell me, and if you feel that you have sufficient facts to detail them, what function the Fraction vein cuts in the determination of the issues that we are trying to try here?

A. I am not attempting to describe the Fraction vein, as one of the important, vital, Geological phenomena in this case. I called attention to it because it is of the same fissure system as the south dipping vein, and unites with it upon strike and dip, and because it lies entirely within trachyte upon both its hanging and foot walls.

Q. Have you undertaken to trace the course of the top of that vein?

A. I have not undertaken to trace the course of the top; we have the top substantially developed at two points within the West End ground.

Q. Was it developed sufficiently to show whether the top crossed the side line or end line?

A. Yes, sir.

Q. What is your deduction in that regard?

A. It crosses the south side line of the West End claim a few feet westerly from the southeast corner of that claim.

Q. In other words it crosses the side line?

A. It does, and extends westerly for several hundred feet within the West End claim.

Q. And terminates against anything?

A. Unites westerly with the south dipping vein, as I believe at the present moment on the 400 level it approaches nearest; there, is a wedge of cap cutting down below the level and obscuring this point of union;

Q. On its upward extension does it terminate within the West End ground?

A. It does.

471 Q. Against what?
A. Against the cap rock.
Q. Against the cap rock?
A. Yes.
Q. Are you sufficiently familiar with the south vein. that we call the south branch of the south dipping vein, that is in the vernacular of the case, I may say that we call it the south vein,—are you sufficiently familiar with that vein to determine the source of its top or apex?
A. Only inferentially; we have the strike of it below the top and we have its dip and we have it at the top at one point; therefore we can show approximately the direction.
Q. What is your judgment about it from the observed facts?
A. What is what?
Q. What is your judgment about the position of that tracing of your top or apex of the south vein, with reference to the side or end lines of the West End?
A. The top or apex of the south branch of the south vein lies within the West End claim, its direction is north 50 degrees east approximately and its dip is to the south until it unites with the main West End or south dipping vein.
Q. And on its dip?
A. On its dip.
Q. That union occurs in West End territory before it reaches the side line?
A. No it does not, not throughout its extent.
Q. What is your conception of the course of that apex or top of the south vein, with reference to the West End south side line?
A. In a general way it is parallel, although it strikes a little more to the northeast.
Q. Parallel with what?
A. With the south side line of the West End claim regarding which you interrogated me.
472 Q. You do not think that it crosses the south side line?
A. The apex of the south branch of the south dipping vein?
Q. Yes.
A. I do not.
Q. Does it cross the end line?
A. I think it does not cross either end line.

Mr. Lindley: Take the witness.

Redirect examination.

Mr. Dickson:

Q. As I understand you, Mr. Winchell, every vein must have boundaries, but not necessarily boundaries that can be seen?
A. That is my understanding.
Q. It may be determinable by assay?
A. Yes.
Q. As I understand both the north dipping vein and the south

dipping vein,—I mean the north dipping vein has a well defined hanging wall?

A. It has.

Q. And an illy defined foot wall boundary?

A. Yes.

Q. The foot wall country having been replaced or impregnated with mineralization?

A. That is in accordance with my observation.

Q. And how about this hanging wall of the south dipping vein; is that a pretty well defined wall?

A. It is a wall that is not so well defined as that in the north dipping vein; the hanging wall is however better defined than the foot wall, referring now to the south dipping vein.

Q. The limit or boundary of the foot wall, the foot wall boundary there, is where the mineralization ceased, the replacement
473 ceased.

Mr. Lindley: If you will permit the interruption I would like to have the witness point out on the model the place where this last cross section appears.

Mr. Dickson: Certainly.

Mr. Lindley: I did that with the other cross sections but I omitted to do so with this. I am referring now Mr. Winchell to "Win.-6" will you point out on the model where that cross section is?

A. That cross section appears to be taken in a general northerly direction through the top of A-Raise and passing near the foot of B-Raise, and crossing through raise 152, as I now hold my pencil.

Mr. Lindley: That is all.

Mr. Dickson:

Q. What is the course or direction of the dip of the north dipping vein where cut by this plane or section, and what is the dip of the south dipping vein where cut by that section?

A. The dip of the north dipping vein as cut by that section is northeasterly and the dip of the south dipping vein on the same section is southeasterly.

Q. I wish to call your attention one moment,—it may not be redirect, but only a question or two,—to the raises going up from the south dipping vein in there,—you give me those numbers.

A. 569, 571, 573, 575.

Q. Have you observed the thickness of the quartz in the south dipping vein where those several raises go up at the line of juncture, with the north dipping vein?

A. I have.

474 Q. And about what is it where each of those raises go up?

A. From fifteen to thirty feet in thickness.

Q. Have you observed the thickness or the height of the stopes

in the south dipping vein, as shown upon this model above which raises 2-A; 4-A; 5-A; 6-A and 7-A are driven up?

A. I have.

Q. And about what is the height of the stopes in the south dipping vein at the bottom of those raises?

A. You mean by the height of the stope,——

Q. The thickness of the vein?

A. The thickness of the vein?

Q. Yes.

A. There are two stopes, one overlying the other at this point, making the total thickness of the south dipping vein more than forty feet at the maximum.

Q. And that is—is that the thickness in round numbers at the plane or line of the juncture of the two veins?

A. That is the thickness of the south dipping vein, about where it meet- and terminates against the north dipping vein.

Q. You spoke in cross examination, as well as in direct of some place or places where, according to your observation, the south dipping vein cut into the quartz of the north dipping vein, which you explained was due to a movement, easterly movement of the north dipping vein. I wish you would, if you can now give a list of the places where that is most observable? I think you said already 569 raise?

A. No, there is a clean cut-off at 569 raise.

Q. Well, go to the places where you have the——

A. That can be seen in raise 573. It can also be seen near the foot of raise 4-A, and to a slight extent at the bottom of 5-A and 6-A.

Q. It is not observable throughout?

475 A. It is not, in some places the quartz of the south dipping vein is shattered and crushed, and it has not had the resistant qualities which enabled it to penetrate into the quartz of the north dipping vein.

Q. Calling your attention to "Winchell X-1" sketch, I understand you to say that there is quartz in the floor of that cross cut beneath which Mr. Lindley has placed the letters "X and Y."

A. Yes, sir.

Q. Are there any developments, workings, near that section to enable you, or anyone, to determine how far beneath the floor of that cross cut the quartz extends downward?

A. No, there are not. Further to the west, similar quartz can be observed more than one hundred feet below the line of meeting of the two veins.

Q. And do you think that is vein quartz to that depth——

Mr. Lindley: Ask him what he thinks, Judge. He is your witness.

Mr. Dickson: You won't object to the question if you hear the whole of it.

Q. Do you think that at the depth of a hundred feet it is still vein quartz, or that it is the silica which you referred to in your

direct examination as having penetrated the rocks before the opening of the fissures?

A. It is quartz like that which is contained in the veins, but it is not mineralized, and it was probably deposited in the rocks before the formation of either the north dipping or the south dipping veins.

Q. Is it true, also, of "Winchell X-4" that in that cross-cut running from the south dipping vein to the north dipping vein as shown in that section that you have quartz in the floor of that cross cut?

476 A. I have not examined it particularly, but it is my impression that there is.

Q. You were interrogated at some length, and with some care, about the fault or a fault which is disclosed in what is marked on the model "W-373"?

A. 573.

Q. 573. That is for winze 573 I take it?

A. Yes, sir.

Q. You have also stated that the north dipping vein is a fault fissure or on a fault plane?

A. I have so stated, and I suggested at one time the name Polaris Fault Vein for this vein.

Q. For the north dipping vein?

A. Yes, sir.

Q. Now, the fault about which you were interrogated at length and just referred to as being at winze 573, the course of that is what, with reference to the course of the fault fissure, fault plane, in which the north dipping vein lies?

A. The fault is nearly vertical and the north dipping vein, has a flat dip, relatively flat dip to the north, therefore they cross each other at an abrupt angle.

Q. And, the strike of the two is very different?

A. Quite different.

Q. How close to the cap rock do the workings extend on this "Winchell X-1" sketch?

A. The cap rock shows in the top of raise 488.

Q. And the gouge which you spoke of on the hanging wall of the north dipping vein, as I understand that gouge is not above the vein, immediately above the ore and below the wall rock?

A. It lies between the quartz and the overlying country rock.

Mr. Dickson: Unless we overlooked something, if your Honor please, the Defendant rests its case in chief.

477 Recross-examination.

Mr. Lindley:

Q. I do not know whether it is important or not, but I would like to straighten myself out on this silicification that you say exists there without being mineralized, before the formation of either vein?

A. Yes, sir.

Q. Well, is this silicification that you refer to in this particular instance the natural component of the rocks itself, of the rock itself, or is it the result of a deposition of siliceous waters flowing through the ground?

A. It is the result of uprising siliceous solutions depositing quartz in the country to a very large extent. The structure of the vein, the north dipping vein, can be seen cutting directly across and through this original early formed quartz.

Q. Then there must have been other openings in this ground before either vein was formed, which caused this silicification?

A. I so described them in my testimony in chief.

Q. That is your understanding that this country was fissured before either vein was formed?

A. Yes, in a north and south direction.

Q. Leaving openings for the penetrations of these siliceous solutions that came up? What is your idea about the source of the mineralization, is it a kind of lateral secretion or is it ascending waters?

A. Ascending waters.

Q. It is not a case of lateral secretion out of the country rock?

A. No, not in a limited sense.

Q. All of this mineralization, speaking of it now in a miner's sense is due to ascending waters from the heated depths below?

478 A. Yes, sir.

Q. And there is no suggestion of secretion or a solution revolving of minerals in the adjacent rocks, and penetrating those different crevices?

A. No, I have not seen it.

Q. Referring to 573 Raise, if you should be informed that the quartz in the bottom of this raise which you describe as not connected with the vein should contain ore values, would your judgment be different?

A. No; I have already stated that I believe that in connection with the formation of the north dipping vein there was a considerable silicification and, in some instances a mineralization of the crushed rock in the wedge which lies immediately underneath the intersection of the two.

Q. And you do not pretend to say from which source it came, being deep seated sources in the original instance, whether it came from the south dipping or north dipping vein or both?

A. My opinion would be that the mineralization extending throughout this crest would probably have been derived from the north dipping vein.

Q. Well, that is your opinion?

A. That is my opinion.

Mr. Lindley: That is all Mr. Winchell.

The Court:

Q. Mr. Winchell, referring to the exhibit "Winchell X-6" did you find any distinct line against which the south dipping vein abuts?

A. Not in that territory. The ground is very much shattered and the quartz up 7-A raise is not typically continuous vein quartz as can be seen in 4-A; 5-A and 2-A, but it is very much broken. The only continuous structure there is the hanging wall.

Q. That section refers to Raise-A, doesn't it, in the western territory?

A. Yes, sir.

479 Q. And that answer would apply there?

A. That is what I understood you.

Q. You said 7-A.

A. Oh, yes, I mis-spoke. I referred to 200 A-raise, the A-raise as we call it.

The Court: That is all.

The Witness: My answer should not have referred to 7-A.

Mr. Lindley: May we adjourn now, to open the case for the plaintiff on Monday morning at ten o'clock?

Mr. Dickson: That is agreeable to our side.

Mr. Lindley: We should like to have you gentlemen place your exhibits at convenient reach, because we have a number of models.

Mr. Dickson: I would like to have this model especially for cross-examination, if I desire to call the attention of your witnesses to it.

Mr. Lindley: Anyway we will accommodate ourselves. I do not think Judge Dickson, you will find any difference between the two models, except possibly the coloring, if we had known the colors that you gentlemen adopted, we would have adopted them upon our model. If you think that it is necessary to compare the two of course they ought to be in reach. They should be placed within reachable distance, but we have several models and we would like to stage them all at once.

Mr. Dickson: There is one thing that we may discuss, maybe out of court, as well as here: Night before last your client requested some additional work to be done.

Mr. Lindley: Yes, sir.

Mr. Dickson: That is being prosecuted. To-day we have been requested to do two additional pieces of work, and there ought to be sometime when this would stop, because it might be necessary, in the light of what might be disclosed by some of the work that we would do at your request, to have additional time to do other work before the case closes. We are willing to go ahead and do the two pieces that you suggested to day, but may we understand that that will be the last?

480

Mr. Lindley: Well, I will simply say this, Judge Dickson, in that behalf, what we are trying to arrive at is the truth.

Mr. Dickson: Surely, both sides want the same chance.

Mr. Lindley: And anything that would tend to establish the truth we must have. I do not apprehend that there is anything farther. These things are brought out from the examination of the witnesses and suggest things that ought to be done to negative the testimony of the witnesses and if it is necessary to establish the truth, if at any time in the course of our case you wish to suggest that

something be done which you think would develop the truth, you must have time to do it. I do not wish to cut this thing off on an arbitrary proposition. I was in the trial of a case once that consumed eight weeks and on the last day of the trial, and the last minute a disclosure was made which we considered tremendously important.

Mr. Dickson: I take it that, as at present advised you have no additional work.

Mr. Lindley: Not that I know of Judge Dickson.

The Court: This case is continued until Monday morning at ten o'clock.

(Adjournment taken until Monday December 14th. 1914, at ten o'clock a. m.)

481 11.

Monday, December 14th, 1914—10 o'clock a. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley: May it please the Court, it is my privilege and pleasure to resume the thread of this course, so far as the Plaintiff in this case is concerned. I have always believed in trials of cases of this character that both the Court and the opposing Counsel should be permitted to view the case as it is about to be presented in its lights and shadows, not approaching an argument upon the merits, but a statement of the facts, with sufficient detail to give to the Court a fair understanding of the situation from the view point of the party presenting the case, in order that the testimony, as it follows, may be clearly apprehended, and exercising a similar function so far as the Counsel upon the other side is concerned.

Cases of this kind require some considerable preparation, and the net result as produced before this Court on the hearing of these cases represents many months of hard labor. It is quite impractical in an opening statement to go through serious detail, but general high lines and outlines of the case, structurally and legally, I think should be presented, and with your Honor's permission, and with the indulgence of Counsel upon the other side, I will state the views of the Plaintiff as to what the vein in controversy is, from our conception, and what the facts as they are developed in the ground determine as an ultimate deduction at the time as to the nature,
482 extent, character and habits of this vein, together with its genesis, the manner in which it was formed and subsequent actions of nature which have modified the conditions presented to the eye in the form of models, as they are submitted here to your Honor, our conception of what the truth is.

In defining the geological conditions, I am reminded that it is important that I should be succinct, at the same time definite, if the statement is to be of any advantage to either the Court or the opposing Counsel, and therefore, with your Honor's permission, I will refer to my notes here wherein is embodied our conception of this vein from a geological viewpoint.

What is known as the West End MacNamara vein, which is to some extent involved in this controversy, has an area greater than that of any other vein in the Tonopah district. The development on it is extensive. It extends in an easterly direction through the properties of the prominent mining companies of the district. Also over the easterly portion of the West End claim it has been developed in a northerly direction through the MacNamara, Tonopah Extension, and for a long distance into the property of the Tonopah Mining Company.

In a southerly direction it has also been developed and ore has been extracted from it for 600 feet, or thereabouts, into the property of the Jim Butler Company.

This vein is essentially a contact vein. It has been known as such in the Tonopah District for years. It is commonly known as the upper contact vein, in contradistinction to what is known as the lower contact vein.

483 It lies at the bottom of the Mizpah trachyte, formerly known as the earlier andesite, and between this rock and the various rock formations which underlie it, except locally where due to irregularities of the contact of the Mizpah trachyte and the underlying rocks, it has cut across the Mizpah trachyte, leaving comparatively small masses of the Mizpah trachyte on its footwall side. Genetically, this vein, as most of the other veins of the district, is definitely associated with the Mizpah trachyte, which is popularly known as the lode porphyry of Tonopah. It is in this rock that most of the productive mines of the district have been developed.

While it is essentially a contact vein, in a broad sense it may also be considered as a fissure vein, the fissure having been controlled in its form and position by the contact as a plane of weakness. And — has already been expressed by the witnesses of the Defendant, before mineralization, it was a zone of fractured rocks, and on account of its nature as a zone of fracture, as distinguished from a definite fissure, was probably not the result of extensive dislocation of the rocks.

The testimony of the Plaintiff will show that the vein at all points where it is observable, whether in the MacNamara, the West End, or the Jim Butler properties, is of precisely this character. And a quartz deposit bearing precious minerals filling and replacing a fractured zone of rock and extending outward along seams into the overlying solid trachyte, as well as into the rocks of the footwall.

484 Certain raises and other workings have been driven from the hanging wall side of the vein, and the gradual diminution of the quartz deposit outward into the barren country rock has been clearly and thoroughly developed. We expect the testimony of the Plaintiff to show that this fissure zone of fractured rocks filled and replaced by quartz and ore minerals, passes into its *the* areal development along the contact mentioned over a roll or anticline the crest of which lies for a portion of its extent within the limits of the West End plane. This anticlinal roll is clear, an accentuated case of a character-stic undulating or rolling habit of the vein. This roll, which pitches in an easterly direction, has been characterized by the Defendant as the line of meeting of two separate

veins. It will be shown by the evidence that the ore, mineralized *structe,* and the size of this vein is similar on the two slopes below the crest of this roll. For similar areas the roll on the opposite sides of the crest below, a similar amount of stopeing, has been done on the south in the west end, and on the north in the MacNamara, although at the time when the MacNamara stopeing was done, conditions made it necessary to limit the stopeing to the higher grade than has been necessary in the operation of the West End Company.

Some of the stopeing done in the early days by the MacNamara Company passed over the crest continuously and was of an identical character, without an interruption or break across the summit or crest.

Similar stopes have been made by the West End Company at points where the crest of this region of the vein lies within the West End Claim, stopes which have passed over the summit of the
485 ridge and downward in its northerly slope. Developments made in connection with this case as shown at many points, continuity of the vein over the roll and downward toward the north. In the immediately adjacent territory of the Tonopah Mining Company to the east, both slopes of the roll have been developed and the vein has been found to be of precisely the same character in both instance-.

In the geological history of the region, after the formation of this vein, with its character-stic undulations, the region was subjected to long continued erosions, developing a surface of pronounced relief in the Mizpah trachyte. Upon this surface of erosion, there was extruded a lava known as the Midway andesite, which varied the outcropping edges of the veins in the lode porphyry.

The extrusion of the Midway andesite was followed by another period of erosion, and as the result of this later erosion, not only was the Midway andesite in a large part removed, but a south westerly slope or hillside is evolved which, in part, underlies the western portion of the West End claim. On part of this eroded slope, the West End MacNamara vein appeared as an outcrop, so that had the region been examined by any prospector at that time, he would undoubtedly have adopted the outcropping of the vein as the lode line of his claim. The out crop of the vein would have presented the usual features of surface outcrop in the breaking down of the quartz, its superficial oxidization, and the development of float down the slope.

The surface on which this outcrop of the vein appeared was
486 at a subsequent time buried by an eruption of volcanic agglomerate and ashes called the Fraction dacite Breccia, which, I understand is our term for the term used by Mr. Winchell the Brough Mountain dacite breccia, from some volcano, the site of which is unknown.

This volcanic agglomerate near its base and in the vicinity of the buried outcrop contains fragments of quartz derived from the vein itself. This buried surface can be clearly seen at several places in the underground workings and its configuration can be*en* very satisfactorily constructed, as has been done in an illustrative model,

which will be offered in evidence, and which, for the purpose of illustration at this point, I desire to exhibit to your Honor.

The original outcrop, before it was buried by the later flow, as delineated at the west end property, the lines of the West End claim are laid over it, and the vein as it existed at that time, prior to the later eruptive rocks which poured out and covered it to form the surface outcrop of the vein. It will be readily seen that the position of the outcrop is directly across the side lines in the West End claim. This model has additional parts, showing the overlying rocks, and from which the witnesses will explain to the Court the sequence in which these rocks were laid down and the occurrence, as I have explained. This buried outcrop or apex of the vein
487 is the top edge of the vein, and is the only edge of the vein that appears anywhere, either at or beneath the surface of any of the claims involved in this dispute. The testimony will show that there is not a terminal edge or any edge of the vein along the crest of the roll or anticline which extends from the western portion of the McNamara, easterly through the West End Claim, but there is an apex or terminal edge crossing the sidelines.

At a time much later than the formation of the vein, later than the first period of erosion, later than the extrusion of the Midway andesite and later even than the second period of erosion and subsequent eruption of the fraction dacite breccia, the region was affected by stresses which resulted in the flat, trough-like fault, dipping in general Northeasterly and for a small portion of its course tangent to the anticlinal roll of the vein along its summit and cutting through the country rocks overlying the vein to the north. It has been upon this fault that nearly all of the litigation work of the Defendant has been done. This fault is also the gouge which has been referred to by Defendant's witnesses as the hanging wall of the north dipping vein. Because of its very probable correlation with the large fault in the Tonopah Mining Company's ground referred to by Mr. Spurr as the Siebert fault, this gouge will be referred to by that name. The movement on the Siebert fault was different in direction from that of the original vein fissure. Defendant's witnesses testified that there is a different- in the character of the hanging wall of the West End-MacNamara vein on its northward slope into the MacNamara territory and its southward slope in the West End. The evidence of Plaintiff will show that there is no difference in the hanging wall of the vein at these various points except as caused
488 by the Siebert fault, which although it coincides approximately with the hanging wall of the vein for a very limited portion of its extent, as above stated, is later than all the mineral contents of the vein and the cap rocks which overlie it and therefore does not constitute a part of the vein. It will be shown in the MacNamara workings, as in the West End workings, where the Siebert fault is not present, penetration of the rocks overlying the vein by vein mineral is identical up to the plane of the fault, where the fault lies at a distance above the main body of the vein. The litigation raises of the Defendant have developed a special condition of the Siebert fault tangent to the hanging wall of the main mass of the

vein at the point where it changes from a northerly to a southerly dip and have shown the fault extending upward to the south through a mass of interlacing stringers, which exist here, as elsewhere as a border zone above the main body of quartz and into the overlying cap rocks. Even if the further evidence of the Siebert fault were lacking from the fact that it cuts into and dislocates the cap rocks, the litigation raises of the Defendant show in themselves that the quartz found in them is not of the same age as the fault, but that this quartz is instead crushed and cut off and does not conform with the gouge of the fault followed by the raises.

This in brief is the outline of the genesis and structure of these veins from the viewpoint of the Plaintiff. In order to exhibit these matters to the Court we have prepared, as I stated in the beginning, numerous maps and models, the main working map which will be marked as "Plaintiff's Exhibit 1," purporting to represent all of the underground workings of both mines, and also of such as are available in the MacNamara, some in the adjoining mines, and were made from actual surveys and represent in horizontal plane these underground workings.

Plaintiff's Exhibit 2 is a model constructed on the same scale as that presented by the Defendant, and so far as mechanical representation upon the model is concerned—that is to say the openings the models represent—I think that they practically correspond
489 with the models presented by the defendant in the case.

The color scheme upon plaintiff's exhibit-2 however has been modified from that adopted by the defendant in the case, because, first we did not know what their color scheme was, and, in the next place we have assumed an arbitrary color to represent different things, and these will all be spoken of and explained in detail by the witnesses upon the stand.

There are some small details in geology and numbering and we have endeavored to follow*ing* the numbering of the defendant in this case, so as to avoid possible confusion. There is also the glass model which represents a series of vertical glass sheets in which we have delineated lines of faulting, lines of the planes, and I will state that the sections shown on these sheets are identified on the main map by their numbers commencing with zero at the extreme east end, and following along in a series of numbers up to number thirteen.

These cross sections are taken, I understand at distinct intervals and are our results *is* illustrated upon the glass model. There will also be introduced in connection with the testimony of the various witnesses, who have made a study of these underground conditions, other cross sections and other illustrations, which are entirely unnecessary to refer to at this time. The two principal models, together with the model which I alluded to in my argument, this is marked as Plaintiff's Exhibit No. 4, represent substantially the models that will be used in the progress of the case. So much for the questions of fact.

I would be permitted at this time,—and I think it is quite proper to state what I consider to be the legal postulates that will occur necessarily from the conditions exposed here, and I have in-

490 dulged in *a* certain hypothetical conditions, which may be classed and discussed very briefly under the subject of legal postulates.

The right to pursue a vein on its downward course, out of and beyond a vertical plane drawn through the sidelines into and underneath the lines adjoining,—when this right exists to any degree, can only be exercised to the extent that the top or apex of the located vein is found within the surface boundaries of the location, or within the vertical planes drawn through them. A common definition of an apex may be noted. The apex is all that portion of the terminal edge of the vein to which the vein has extension downward in the direction of the dip. This definition involves the element of terminal edge and downward course. Where the terminal edge from which there is a course downward appeared at the surface in the form of an outcrop, this outcrop constituted the apex, and in this sense the term is synonymous with outcrop. Where the terminal edge from which there is a downward course is covered with the cap, the plane of contact and the cap constitute the apex. The course or flow of an anticline vein is not an apex. As it is our contention that this vein is one vein and its form is anticlinal, there is no terminal edge along the axis of the anticlinal, which can be deemed to be the terminal edge. The vein dips in both directions from the axis.

There can be no extralateral rights predicated on any such occurrence.

Second. The only terminal edge which is shown on this vein is that which is in contact with the overlying cap-rock-fraction dacite breccia—in the most easterly working of the mine.

If the surface as it originally stood at the time we exposed
491 it it would present an outcrop, apex or terminal edge, and would be the line along which the miner would locate his claim. This terminal edge or ancient outcrop crosses both side lines of the West End Claim. If there be a terminal edge its extralateral is easterly and not northerly or southerly.

Third. If we for a moment consider the occurrences as two veins—no-th dipping and south dipping—joining at their tops, the discovery vein is the north dipping one and the extralateral right is defined by extending the end line planes in the direction of the downward course of that north vein.

Fourth. The south dipping vein is a secondary one, and the same plane must be applied, and in the same direction as on the discovery vein. There is no sanction in the law for a double-barrelled or bifurcated extralateral right in two opposite directions.

Fifth. In order that there should be an extralateral right the end lines must be parallel throughout, and cannot be a curved or a broken line. The West End claim has a broken west end line;—therefore no extralateral right.

Now, if your Honor please, with this brief explanation of the status and attitude of the plaintiff with reference to this case we will proceed to put in our case as rapidly, and I trust as courteously as has been presented on the part of the defendant thus far.

219

492 Testimony of E. A. BYLER, who being called and sworn as a witness on behalf of the plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley: I will state that the survey upon which the maps and models were made was made by three different surveyors, and the notes were all turned over and tabulated and the model made upon those notes,—and Mr. Byler was one of the surveyors.

Q. Mr. Byler, what is your profession?
A. Civil and Mining Engineer.
Q. How long have you been engaged in that business?
A. About twenty two years.
Q. Have you carried on your business in Tonopah?
A. I have, in Tonopah and other places.
Q. Have you made any surveys of the property known as the West End, McNamara, Jim Butler properties,—the underground workings?
A. I have.
Q. What surveys did you make?
A. I made a survey of a large portion of the West End underground workings, the part of the Tonopah workings that is shown on the map, and all of the McNamara workings that are shown upon the map.
Q. To whom did you give your notes?
A. I platted part of them on the map and Mr. Uren did the rest of them.
493 Q. Such part as you have platted on the map are correctly platted?
A. Yes.
Q. Did you examine the map to determine whether Mr. Uren's platting is in accordance with your notes?
A. Yes, I have examined a large part of it and found it correct as far as I have gone.

Mr. Lindley: That is all.
Mr. Dickson: I have no cross examination.

Testimony of O. MCCRANEY, being called and sworn as a witness on behalf of the Plaintiff testified as follows, to wit:

Direct examination.

Mr. Lindley:

Q. What is your profession?
A. Mining Engineer.
Q. You are also a Civil Engineer and Surveyor?
A. Yes.
Q. Did you make any survey of the property in the Tonopah District known as the West End or McNamara properties?
A. Yes, sir.
Q. To what extent did you make the survey?
A. Why, I surveyed the greater part of the Butler workings that

show upon the map and a portion of the underground workings of the West End mine.

Q. How long have you been engaged in the practice of your profession?

A. Nine years.

494 Q. Have you examined the map marked Plaintiff's Exhibit 1, *the* determine whether your notes have been correctly platted?

A. Yes.

Q. Have they?

A. So far as I can see they have.

Q. To whom did you deliver those notes?

A. Some to Mr. Uren and some to Mr. Robens.

Q. Mr. Robens is an Engineer?

A. An Engineer at the Belmont and the Butler, yes.

Mr. Lindley: Take the witness.

Mr. Dickson: No cross examination.

E. C. UREN, being called and sworn as a witness on behalf of the Plaintiff, testified as follows:

Direct examination.

Mr. Lindley:

Q. What is your profession?

A. Mining Engineer.

Q. In what branches?

A. I have devoted my time mostly to under ground engineering and to mapping and model engineering.

Q. And surveying?

A. And surveying.

Q. Have you surveyed any part of the mines, the properties, delineated upon Plaintiff's Exhibit No. 1?

A. I have surveyed the westerly portion of the 400 level, and also the westerly portion of the stope between the three and four hundred levels of the West End claim.

495 Q. With reference to this map, Plaintiff s Exhibit-1, who made that map?

A. I made it.

Q. From what?

A. From notes given to me by Mr. Byler, and a part of which were platted by him. The greater portion, in fact, were platted by Mr. Byler.

Q. And other notes?

A. And notes which were platted by myself of that portion of which I made the survey.

Q. Did you get any notes of the Byler survey from McCraney?

A. Yes, we got the notes from Mr. McCraney of the Butler and placed them upon that map.

496 Q. What does that map then, so far as a combination of the surveys, underground?

A. It represents the actual underground conditions, beneath the surface of the claims as represented.

Q. From what?

A. Made from notes of the surveys which have been previously sworn to.

Q. What do the *the* colors on the map designate?

A. The colors on the drifts are merely placed thereon to designate the difference between one level and another, and the green border follows the boundary line of the West End claim, while the red tint follows the boundary of the Butler property, taken as a whole, which is shown upon that map.

Q. The surveys of the lines of the property are properly delineated upon that map?

A. They are.

Q. With reference to the numbering have you adopted any system of numbering so as to identify the locality by the first number?

A. We have adopted as nearly as possible the numbers used by the defendant in the case, but in some instances where the survey made by us was previous to theirs, of course, the numbers are different, and I have taken a series of numbers on the ends of the drifts, and at points where I thought testimony would be introduced and given them an arbitrary number, generally the number of the station followed by the letter "A" or "B" or some letter of the alphabet.

Q. The light yellow coloring indicates what? Is that a yellow?

A. It is a more a sienna coloring or brown

Q. I have reference to that color (indicating).

A. That color follows the area of stoped ground from which
497 the ore has been taken.

Q. That represents stopes?

A. Yes, sir.

Q. Have you any method of representing winzes, as contradistinguished to upraises?

A. I have. I place—in making a raise I make an arrow pointed line following the direction of the dip.

Q. How with winzes?

A. With winzes the same.

Q. How with cross cuts?

A. With cross cuts there is no designation upon that map.

Q. Now there are a series of lines commencing at the extreme east end or near the extreme end of the workings and numbered from zero up to thirteen. What do those lines represent?

A. Those lines are true north and south lines, from which the survey is coordinated. They represent sections which are shown upon the glass model and are one hundred feet apart.

Q. The glass model is identified as what exhibit number?

A. Plaintiff's Exhibit No. 3.

Q. There are other lines designated upon the map for instance the line, is that GG?

A. Yes, sir.

Q. And YX, what lines do those represent?

A. Lines GG and XY represent the plane of the section which we have as future exhibits.

Q. And the line PM?

A. That also exhibits the plane of the section.

Q. Now, in connection with this map in the preparation of your work and your duties in connection with this case, have you constructed any models?

A. I have.

Q. Calling your attention to Plaintiff's Exhibit-2, was that model constructed by you or under your supervision?

A. That model was constructed by Mr. Douglass of the Belmont, under my supervision.

498 Q. And what does it purport to represent?

A. It purports to represent a matrix, as it were of the underground workings. In other words it shows in solid what has been taken out and would be an excavation underground.

Q. From what was that model constructed?

A. It was constructed from the same notes which have been used in compiling Plaintiff's Exhibit-1.

Q. Is it correct?

A. It is.

Q. By whose direction, if any one's, were the colors placed upon the model?

A. The colors were placed upon the model under the direction of Mr. Finch and Mr. Searls.

Q. The red on that model indicates what? The red color if you know.

A. That indicates vein.

Q. And the other colors something else?

A. Yes.

Q. Those colors were selected, as I understand by the engineers, Mr. Searls and Mr. Finch?

A. Yes.

Q. Now with reference to the glass model which is Plaintiff's Exhibit-3. State who constructed that and upon what is it constructed, and what part you took in it?

A. The glass model was practically all constructed by myself from sections compiled by Mr. Searls and Mr. Finch, and are the same—they correspond with sections No. 1 to 13 upon Plaintiff's Exhibit No. 1, marked upon the top of the map.

Q. Briefly, what is shown upon that model other than the veins in reference to lines?

A. The lines of the drifts levels, raises and winzes, are shown, when they are slightly off the section by dotted lines. Those portions cut by the section are etched in black. The claim lines

499 are shown in black also. The fault lines are shown in blue. The Fraction diabase breccia is shown——

Q. Fraction dacite breccia?

A. Fraction dacite breccia is shown by a legend which is printed upon the first sheet here in black etching, colored with a light green. The Midway andesite is shown by a cross hatching in black. The

Mizpah trachyte is shown by green dashes placed close together, and the West End rhyolite by a legend, the sloping lines and dots, as shown upon Plaintiff's exhibit 3 in the legend.

Q. And those markings were put on under the direction of whom?

A. Under the direction of Mr. Finch and Mr. Searls.

Q. So far as they represent the mechanical reproduction of the openings, is the model correct?

A. It is. It has been checked and rechecked.

Q. With reference to the model marked "Plaintiff's Exhibit No. 4," I will ask you who constructed that model, Mr. Uren?

A. I constructed it.

Q. Under whose direction?

A. Under the direction of Mr. Finch.

Q. The legend upon the model indicates that it was drawn upon a scale of 100 feet to the inch?

A. Yes sir.

Q. I will ask you, so far as the mechanical parts of that model, the parts other than its geology, if it corresponds to the facts as shown by the survey?

A. As nearly as possible.

Q. The scale is smaller than the——

500 A. Yes sir.

Mr. Lindley: The further explanation of that model will be reserved until we put Mr. Finch on the stand. Any questions? I am through with the witness.

Cross-examination.

Mr. Dickson:

(Q.) Your map, exhibit 1, is on a scale of 20 feet to the inch?

A. Yes sir.

Q. While the general plan map of the Defendant Company is 40 feet to the inch, as you observed?

A. So I understand, I did not see it.

Q. Apart from the fact that the Plaintiff's Exhibit 1 is a much more artistic piece of work, more beautiful than that of the general plan map of the Defendant Company, and the different scale, is there any other difference that you are aware of? Anything omitted from your Exhibit 1 that is found on the Defendant's plan map, Exhibit B, I think it is, that you are aware of?

A. Not having seen Defendant's 40 scale map, I could — say. But I do not know anything that has been omitted on there. If there is, it certainly was not intentional.

Q. I am not intimating that that was so. Is there anything included, so far as you know, in the platting of the workings shown on Plaintiff's exhibit 1 that was not found on Defendant's general plan map, exhibit B?

A. There may be one stope which I intended to refer to with reference to Plaintiff's exhibit 2, and that is the stope numbered

501 upon this exhibit 2 No. 12.

Q. Is that not found on the Defendant's——

A. That is found on the Defendant's map or model. It is on the model, I know, but we were unable to get into the interior of that stope, and I took the liberty of putting it on after seeing Defendant's model in Court the other day.

Mr. Lindley:

(Q.) That stope is not platted on the map?
A. That stope is here on Plaintiff's exhibit 1, north of Station M, raise 38 on the MacNamara 200 level.
Q. It is not fully delineated on that?
A. It is not, because it was inaccessible.
Q. And you did not have the notes?
A. Didn't have the notes.
Q. I understand you that particular stope, however, you have undertaken to reproduce on your model, taken from the model of the Defendant which is on the same scale of yours?
A. Yes, we have filled in the interior of the stope, in other words, without the notes.
Q. You had an outline of the stope as it appears on that map?
A. Nearly all of the outline.

Mr. Dickson:

(Q.) What is your understanding, Mr. Uren, then, as to what the green on the Plaintiff's model exhibit 2 is intended to represent?
A. Which green?
Q. Well, are there two greens here?
A. Well, there is a green string following the exterior boundaries; I didn't know which——
Q. No, I do not refer to that. The workings, drifts?
502 A. That represents Mizpah trachyte, as I understand.
Q. That is what I am asking for. What coloring do you call this to which I now point?
A. That is orange.
Q. There is no figures here, no name to this line of work in the model?
A. That is the 700 Butler level.
Q. And why is that color adopted there?
A. That represents the Fraction vein. It is an orange color.
Q. Now, what is shown on Exhibit 2, Plaintiff's Exhibit 2 in yellow? What is your understanding as to what——
A. I understand that is the Fraction dacite breccia.
Q. Are there any other colors than the red and the green, and what do you call this brown?
A. That is an orange.
Q. Orange and the yellow?
A. Yes.
Q. What others?
A. There is a purple.
Q. Just point to it.

(Witness indicates.)

Q. What do you understand the purple is intended to represent?
A. I understand that represents the Midway andesite.
Q. Now, is there any other color that I have overlooked?

Mr. Lindley: Yes, if you will look in your upraises, you will see blue color.

Mr. Dickson:

(Q.) This represents faults, I presume?
Mr. Lindley: Yes.
The Witness: Not altogether. There is a light blue——

Mr. Dickson:

(Q.) Do you call this the light blue?
503 A. Yes, on the 600 Tonopah mining level.
Q. What is that intended to represent, as you understand?
A. As I understand, that is the glassy trachyte.
Q. And where is your dark blue?
A. The dark blue is on raises 2 A, 3 A, and so on.
Q. And what do you understand that was intended to represent?
A. They represent the Siebert fault and other faults.
Q. That darker blue represents faults, then, one fault or another?
A. That is my understanding.
Q. What color is this to which I now point?
A. That is a brown, and as I understand it, represents the West End rhyolite.
Q. What color do you call that?
A. Brown.
Q. Now, are there any other colors?
A. I think that is all.

Mr. Lindley: Black.
Mr. Dickson: I would like to have the Defendant's exhibit A uncovered. I wish it were here (indicating).
Mr. Lindley: Well, anything that you want done, you have the privilege of doing.
Mr. Dickson: Have it moved here now while I am interrogating Mr. Uren, and then if it is in your way it can be moved back again.
Mr. Lindley: That is all right, Judge. Go right along. Can you accomplish the same result by having it over there, Judge, and let the witness go and examine it?
Mr. Dickson: Have to go from one to the other, that is all,
504 take a little time.
Mr. Lindley: Well, let us try it. I do not care. Simply we are getting into a small corner here for active work.

Mr. Dickson:

Q. Mr. Uren, you have not shown the Fraction vein stopeing that is Exhibit-2.
A. I have shown two stopes in fact three.

Mr. Lindley:

Q. That is the south vein?

A. Pardon me. I have shown one stope on the Fraction vein, and that is stope No. 24 on the 400 level of the West End.

Mr. Dickson:

Q. You observe a difference in the stope represented on Exhibit-2, in which we find the figures 19, from the same stope as shown on the Defendant's Exhibit-A?

A. I do.

Q. And how do you account for that difference?

A. I was told that stope 19 was upon the West End vein, or a portion of the West End McNamara vein.

Q. It is different in shape also is it not?

A. It is different in shape, yes.

Q. And in size?

A. And in size.

Q. And how do you account for those differences in size and shape of the same stope as shown upon the two models?

A. I had not observed it upon the defendant's model.

Q. Just step over a moment and see.

—. (Witness inspecting defendant's model.) The stope on Exhibit 2,—defendant's exhibit 2, is not intended to represent the same stope, 728 and 724, I notice a slight difference possibly, but nothing extreme.

Q. You examined this model in court with some care?

A. I did, some two or three days ago.

505 Q. So far as the underground workings are concerned, so far as including the ore bodies or stopes,—is there anything shown to your knowledge upon Plaintiff's Exhibit 2, that is not shown substantially the same on Plaintiff's Exhibit-A?

A. I think that there is a little difference between the two models.

Q. *Do* far as you have been able to observe, they are practically identical, so far as the mechanical parts are concerned?

A. Yes.

Q. Some difference in color only?

A. That is all.

Q. Do you understand that Plaintiff's Exhibit 2 *shown,* or is intended to show all of the underground workings of the properties, so far as they are covered by the model?

A. Not altogether, no.

Q. What?

A. Not altogether.

Q. Well, practically all?

A. I would say that the Butler workings, the Butler stopes in particular, are not shown upon this model.

Q. Upon your model?

A. No.

Q. Well, in that respect there is a difference between the defendant's model and the Plaintiff's model?

A. There is more stopeing shown upon the defendant's model in the Butler workings, particularly, than upon this.

Q. The workings shown upon the defendant's model in the Butler

workings, 100 or 150 feet east of the east end line of the West End claim,—they are not shown upon Plaintiff's exhibit 2 those workings?

A. They are not; the stopeing is not.

Q. Have you shown any workings or any openings on Plaintiff's Exhibit 2, east of the east end line of the West End claim on Plaintiff's Exhibit 2, is there shown any workings or stopeings in
506 the ground that lie east of the east end line of the West End claim?

A. There is.

Q. What?

A. This T. M. Co. stope.

Q. Any other?

A. The anticlinal stope No. 19, also stope No. 15 in T. M. ground.

Mr. Lindley:

Q. That T. M. is Tonopah Mining Company, is it not Mr. Uren?

A. That is Tonopah Mining. That is all the stopeing that is shown outside of the east end line of the West End claim.

Mr. Dickson:

Q. Those stopes are also shown upon the Defendant's model, Exhibit-A and additional stopeing east of that?

A. Yes, sir.

Q. Is it your understanding that this model represents, or was intended to represent all of the workings upon the vein or veins, so far as they lie within the property of the McNamara Company, of the West End company, and the Eureka and Curtis claims of the plaintiff.

A. No, that is not my understanding.

Q. I was wrong about that. Does this model represent, or is it intended to represent all of the workings ore occurrences, or stopes, that are found in the vein in controversy which lie beneath the surface of the Eureka and Curtis mining claims owned by the Plaintiff company?

A. It does not represent all beneath the surface of the Curtis claim. I think that is the only exception.

Q. And is that an exception of minor importance?

A. We considered it so.

Q. Is the model intended to represent all of the openings and stopes, lower occurrences, as found upon the vein or veins
507 in controversy, that lie beneath the surface of the West End claim?

A. Everything that was accessable and possible to get, with the exception that there are two or three possible minor stopes that are not on there. I am not certain. We were rushed at the last moment, and there may be two or three smaller stopes that are not on there.

Q. Any that was omitted would be insignificant?

A. Yes.

Q. And the model as you understand it, is intended to represent

all of the workings and stopes, ore occurrences on the vein, so far as the model extends to the north, northerly?

A. It does, there is one exception and that is a small stope just to the west of the stope ten, which would be on an extension that we intended to place upon the model, but part of that stope was in such a position that we could not place it. I had it already cut out.

Q. That is virtually on stope ten?

A. Yes.

Q. That westerly stope is not shown upon Exhibit 2, but it is shown upon Defendant's Exhibit -A is it not? You cannot see from there—now, having on the model all of the workings, all of the openings and stopes and ore occurrences, this model so far as it extends easterly and westerly or northerly and southerly should present a reproduction of the underground workings and ore occurrences whether still remaining in the mine or which have been excavated and removed,—should it not?

A. Yes.

Q. That is the intention?

A. That is the intention.

Q. So that if the surface overlying the vein or veins has been removed, and the earth from that on down was transparent as glass, anyone walking over it and looking down could see the work-
508 ings and the stopes on the ore, just as they are in the mine?

A. Yes.

Q. That being so, what additional light is thrown upon the condition, as you understand it, by the stope, exhibit -3 or the glass model?

A. Well, the additional light, in my opinion is that we get a better idea of the layers of geology, as it were, by looking at the sections.

Q. What geology do you refer to?

A. I refer to the geology previously described on Exhibit 2.

Q. Will you be good enough to describe it again. I did not hear all that you said, what geology do you refer to particularly?

A. I refer to the geology colored upon Exhibit 2, which has previously been described.

Q. Well that is shown on Exhibit two, as fully and extensively as it is shown on exhibit-3, is it not?

A. Yes, a considerable amount of it is in such a separated condition that it is hard to judge, looking at either one way or the other, the actual condition on any particular cross section which you take,——

Q. The model, Exhibit 2 contains everything, so far as workings and ore occurrences are involved, and more also than is shown upon the glass model, Exhibit-3?

A. There is an exception to that and that is with reference to those faults, which can only be shown upon the portions which are in relief on the model.

Q. Well, with the exception of the faults, the model, Exhibit 2, shows all and more, so far as the workings and ore occurrences are concerned, than does the glass model, Exhibit-3?

A. Well, not to me; the connection is made from one point
509 to another upon the glass.

Q. What?

A. The connection between the layers of geology are made upon the glass, where they could not be made upon the model.

Q. Well, I will modify the question then somewhat. So far as the underground workings in the mine within that area covered by the model, Exhibit-2, more is shown,—all is shown that is shown upon the glass model, Exhibit-3 and more too?

A. With reference only to the openings, not the geology.

Q. I am speaking of the workings first.

A. As far as the actual workings are concerned, yes.

Q. And so far as the vein itself is concerned, and apart from the rocks that may lie above or below it, the geology that you refer to,—so far as the vein or veins itself or themselves are concerned, all is shown upon Exhibit-2 that is shown on the glass model, and more too.

A. I do not think so.

Mr. Lindley: Well, it seems to me just as a suggestion, as to the comparative value of these two models as evidence, I do not think that it is proper cross examination. Of course I do not care,—they show for themselves, and we all know that these models are made to illustrate testimony as much as anything else. You are asking the witness to draw a conclusion, which I do not think is proper,—well, is hardly within the scope of the witness.

Mr. Dickson: I suppose that if he constructed both models he would be able to answer that.

The Witness: I think I can.

Mr. Lindley: Well, who put the geology on that,——

Mr. Dickson: I am speaking of the vein itself, the ore
510 bodies that lie in the vein.

Mr. Lindley: All right.

Mr. Dickson: All that is shown on the glass model is shown by Exhibit-2 and more too, so far as the vein itself is concerned?

A. I do not consider that it is.

Q. What is shown so far as the ore or vein material of the glass model, that does not appear upon the wooden model?

A. I look at it this way: The glass model is clearer; we draw a section through any part of this model where we get directions upon the vein, which may be one hundred feet apart, can fairly be created by projections; it shows much clearer upon the glass model than upon that model.

Q. Made clearer by projections. Anyone looking upon this model, Exhibit-2, the underlying portion being transparent, they would have a perfect picture without any projections?

A. As far as the actual openings are concerned, yes.

Q. But so far as they differ, the ore is concerned?

A. If they could see also the vein which had not been removed, which you can here, it would be still clearer.

Q. Well, if that is intended to represent everything that can be

seen in the ground, and it would be transparent, it would give a complete picture as far as anything on there——

Mr. Lindley: Well, the purpose in putting the witness on is to identify the model, and the geology that was put on there is another consideration.

Mr. Dickson: Have you any objection to the question?

Mr. Lindley: No.

Mr. Dickson:

Q. Is anything represented on the glass model or any of the several sheets of the glass model, that could not be observed by one if he was looking through or along that identical plane of section under the ground; that he could not see if he had this wooden model before him?

A. I think there is; for instance the surface is one thing that we have on here and we have not——

Q. I am speaking of the underground workings and the vein or veins?

A. Not as to actual openings, no.

Q. Nor the ore occurrences, so far as they have been developed?

A. So far as they have been developed.

Mr. Dickson: That is all.

Mr. Lindley: That is all.

Mr. Lindley: I presume that we may proceed as we did when the defendant was putting its part of the case in, and assume that these different exhibits, as they are identified by the witnesses, may be presumed to be introduced in evidence.

Mr. Dickson: Yes.

510*a* JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

TRANSCRIPT OF TESTIMONY.

Volume I.

510*b* In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Certificate of the Court Reporter.

I, Joseph Lozano, do hereby certify that pursuant to stipulation made and entered into between the above-entitled parties and their

counsel, I acted as shorthand reporter of the above-entitled court and acted as such in the trial of the above-entitled cause; that the annexed and foregoing shorthand report of evidence, herein designated as Volume I., together with Volume II. herein, is a full, true and complete report of the evidence in the said cause, and contains, with the exhibits, records and documentary evidence therein referred to and identified, all the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; all of the objections and motions of the said parties thereto, or any part thereof; and all rulings of the court upon such objections and motions, and all exceptions to such rulings, had and taken during said trial.

Signed this — day of August, 1915.

——— ———.

510c I, Mark R. Averill, do hereby certify that I am the Judge before whom the above-entitled cause was tried; that Joseph Lozano was, by stipulation of the parties, the shorthand reporter who reported said cause; that the annexed and foregoing shorthand report of evidence, designated as Volume I. together with Volume II. herein, duly certified by the said reporter, is the report of the evidence in said cause, and contains, with the records, exhibits and documentary evidence therein referred to and identified, all of the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; and all objections and motions of said parties thereto, or any part thereof; and all rulings of the court upon such objections and motions, and all exceptions to such rulings, had and taken at said trial.

Dated: This 28 day of August, 1915.

MARK R. AVERILL,
District Judge.

510d In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Respondent.

Certificate of Clerk.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada do hereby certify that the foregoing pages 1 to 510 inclusive, comprising Volume 1 of the Record on Appeal in the above entitled cause have been each compared and the same is a true and correct copy of the original now on file in my office.

Given under my hand and seal of said court, this Seventh day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

[United States internal revenue documentary stamp, series of 1914, ten cents, canceled 8/8/16. H. R. M.]

510*e* In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff and Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant and Respondent.

RECORD ON APPEAL.

510*f* In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Bill of Exceptions and Record on Appeal.

(Volume II.)

510*g* JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Transcript of Testimony.

Volume 2.

511 Testimony of JOHN W. FINCH, — being called and sworn as a witness for the Plaintiff, testified as follows, to wit.

Direct examination.

Mr. Lindley:

Q. Where do you reside, Mr. Finch?

512 A. Denver.

Q. What is your profession?
A. Geologist and Engineer.
Q. Where do you reside?
A. Denver.
Q. How long have you been engaged in the practice of that profession?

Mr. Dickson: We will admit his competency Mr. Lindley.

Mr. Lindley: Thank you. I want to say right here that this is the most disagreeable part that a scientific witness has to undergo, but he has to undergo it because it is a rigid rule. We admit then as a matter of courtesy, but I myself feel, every time a scientific witness is put upon the stand and compelled to recite his qualifications, as a preliminary that it is to a certain degree humiliating and yet, at the same time it is the rule, and as it is so we will have to go on.

513 Q. Proceed and give us an outline of your career, in a brief way, your preliminary training, your experience, and the extent to which you have been engaged in the study of mining geology?

A. I have been actively engaged, in answer to the beginning of the question, for about 16 years in the actual business of mining, and the practice as a mining geologist and engineer.

My education consisted of a rather unusually long college course, in which I made a good deal of a specialty of the study of geology, but also during college and in post graduate work after college, studied those scientific subjects which go to make up the education of a mining engineer.

I have taken as college degrees, the degree of bachelor of arts, master of arts, and doctor of science. During the post graduate part of my education in the University of Chicago, and also for one year in Colgate University, I acted as instructor in geology. Also acted as an editor of manuscripts of the journal of geology.

Also served as instructor for a year in physics, and to a certain extent in mathematics, not only in my college course, but afterwards.

After leaving the University, my first experience in practical work in the field was in making maps setting forth the resources of what is now Oklahoma, and a large part of Texas, and Indian Territory, for the Rock Island Railroad.

After that job was finished, I began to go into more strictly the business of mining. Went to Cripple Creek and acted as the engineer and geologist first for one mining company, and after-
514 wards from time to time in a consulting way for a large majority of the mining companies of that district. And during the same period and afterwards, I was called upon to serve as consulting engineer in the examination of mines, to ascertain their value and to advise in the development of ore in the western states of the United States, Canada, Mexico, and largely for my own information, points in Europe. I do not think there is anything else of special interest.

Q. Have you examined the properties that are in controversy in this action, involving what is known as the West End, Jim Butler properties, and the adjacent properties?

A. I have.

Q. I will ask you if you have—to what extent your examinations in the Tonopah District have proceeded in connection with your examinations of these properties? To what extent have you investigated and studied the underground conditions, and how long you have been engaged in that study?

A. For a certain period a number of years ago I used to be in the Tonopah district quite often and had some knowledge of the developments here, say ten years ago, or thereabouts, and from that time on for a number of years. But the developments which have been made in the West End claim and the immediately adjacent properties, involved in this case, have been made largely since that time, and my knowledge of them has been derived since early in April of this year. And since that time I must have spent six weeks, or thereabouts in as critical study of the geological conditions as it was possible for me to make.

515 Q. Can you give us a statement, with reference to the area covered by your immediate investigation in connection with the properties in controversy?

A. That can be briefly stated as the area covered by Plaintiff's exhibit 1, and distance of a thousand feet, or thereabouts, to the south and south eastward, and considerably larger distances into the property of the Tonopah Mining Company to the east of the West End claim, and somewhat further into the working of the Tonopah Mining Company towards the north.

Q. I will ask you, before undertaking to describe the result of your investigations, if you will give us a brief statement as to the significance of the coloring on Plaintiff's exhibit 2, and at whose direction the colors were placed upon that model?

A. The color was placed upon the model under the direction of Mr. Searls and myself, and under the advice, which we used at all times so far as it was available, of Professor Lawson. The coloring of the model represents first, the most conspicuous feature, and the thing which the model is primarily intended to represent, the West End MacNarama vein, which is shown in red. Blue markings upon the model at various points, as, for instance, towards the easterly end of it, along certain high points in the MacNamara West End vein, show faults.

Q. And the two colors of blue upon the model?

A. The color last referred to is the dark blue on the model. In one limited area toward the east end, and particularly in the Tonopah Mining Company workings, another lighter blue is used to
516 indicate the glassy trachyte, which underlies the vein in that region.

Mr. Dickson: I did not hear the last of that answer.

A. Which underlies the vein in that region. The green color, or bright color as shown around the Jim Butler workings and through-

out the model, mostly just above the vein, is the Mizpah trachyte. Next above the green color after the shafts in the central area of the model, will be seen a violet or purple color, which represents the Midway andesite cap rock. Above this still higher is a bright yellow color, which is another cap rock or Fraction dacite breccia.

Green strings extending downward below the model connect with the outline of the West End claim shown upon the map at the base of the model, which forms the mathematical basis for the construction of the model itself.

Underlying the vein in most of the area of the model is another rock which is shown in brown in various workings under the vein, as painted in red. This is the west end rhyolite, colored brown. Black occurs at various points on the model and is intended to be the color of structural features.

Mr. Lindley:

(Q.) Structural features of the model?

A. Yes.

Q. Not of the geology——

A. Not geological structure.

Q. Supports of the model?

A. For instance, some of the shafts do not extend all the way to the base of the model, but are convenient as mechanical means of support, and to that extent they are colored black.

517 Q. In other words, instead of leaving the bottom of the shaft in the air, you put a support on it and colored it in black?

A. Let it continue down, because it helps to hold the model up.

Q. With reference to the model, Plaintiff's exhibit 3, will you explain to the Court the function of that model? What its purpose is, what it purports to show, how it was made, and under whose auspices, whose direction?

A. It was made by Mr. Uren, from rough drawings prepared by Mr. Searls and myself, and embodying also geological information. Partly occupied with other things, and I did not state that entirely correctly. I wish to amend that by saying that during the study of the geology of this case, Mr. Searls, Mr. Siebert and myself have combined our notes, compared our notes and prepared a series of sections, from which Mr. Uren has prepared the glass sheets in Exhibit 3. In the preparation of those cross sections, and in the making up of our notes, we have had the advice of Professor Lawson for a large part of the work. So that it embodies the geological views of all of us.

To explain the construction of the glass model, I hold now in my hand just one of the cross sections which were constructed or inked in, beautified by Mr. Uren. This section No. 7, being the 7th sheet, showing the geology in the glass model; as will be seen from the sheet, certain workings are represented on any given plane of the section, these are colored in yellow. To that extent, the cross section drawings represent the same things shown in that given

518 plane in exhibit 2, or the skeleton model. The purpose and effect of cross section Exhibits of this kind is to enable a con-

tinuous representation of vein and geological structure to be made, where there are gaps in a skeleton model such as exhibit-2.

Q. Now, I will also invite your attention to Plaintiff's Exhibit No. 4, and simply identify it as to circumstances under which it was constructed, and when we reach that period in your examination when it will be appropriate to discuss the details of the model, you may then take up the details. But I now call your attention to Plaintiff's exhibit 4, what we might call a block model. I will ask you to state how that was prepared, by whom that was prepared?

A. Plaintiff's exhibit No. 4 is a model constructed in several segments. It is made of wood in the main. There are certain irregular surfaces between the several blocks composing it, so irregular that it was necessary to supplement the wood by plaster, so the model is a little fragile for that reason. The Plaster tipping off unless it is handled carefully. The data for the model was of two kinds; one, mathmetical, which is the surveys and maps already described. The other is geological, and is determined by geological observations in the ground. The mathematical part of it, of course, was in Mr. Uren's possession. The geological part of it, I supplied to him and the mechanical part of it, he executed. The model represents at its surface, when it is all placed together, represents the present surface of the ground; of course, as accurately as within the limita-
519 tions of material of this kind. It is not possible to build it so accurately as it is to draw a map.

Q. Considering the scale?

A. Yes. The uppermost layer being taken off, removes this particular area which corresponds, in a general way, with the area covered by the big plan map on the wall. This upper surface, the upper block of the model being ta*kne* off, the fraction dacite breccia is removed, showing a hillside or sloping surface mentioned by yourself, Judge Lindley, in your opening statement.

The surface of the ground in the model, as it now stands, was at the time when this surface existed, higher than at the present time. No attempt has been made to indicate that.

Also subsequent to this surface, there has been some faulting but—all the essential parts of it, will be discussed, that has not been represented except on the edge of the model.

The little block which I am now taking off, lying in the north east corner of the model is of an ir-egular form, and the sinuous edge of it is not to be understood to represent anything in the nature of geological feature, or otherwise. That is merely a mechanical means of filling up to the present surface beyond the edge of the fraction dacite breccia, *at* it is now known.

Q. What does that represent?

A. Nothing except the filling of that corner beyond the fraction dacite breccia and over the hanging wall side of the vein. Removing the 3rd block from the model, the Midway andesite cap is removed from the vein. Also a certain amount of the hanging wall
520 lode porphyry above the vein, and the hanging wall of the West End MacNamara vein is shown, generalized to a certain extent, but on the whole conforming very closely with the more de-

tailed sections shown in exhibit 3. The western end of the section, then, that is that end of it at and beyond the west end lines of the west end claim shows a portion of the old eroded surface and the outcrop of the West End MacNamara vein, as it existed on a hillside when this old surface was the surface of the earth.

Q. Now, Mr. Finch, I wish you would proceed and state as succinctly as you can the extent of your investigation, the nature of your investigation, and describe the results of that investigation, so far as you have investigated the property, giving as you pass along and state a deduction, giving the reasons for it?

In order to not interrupt you in the chain of thought, I will not do so unless some question of importance suggests itself by way of parenthesis.

A. If it would be entirely proper to do so, I should like to preface or to begin the answer of that question with a general statement of the geological conditions as I have found them in the ground, in order that the separate details may be more conveniently fitted together as I proceed.

For that purpose, I should like to have some sheets of blank paper which I saw lying here yesterday.

(Same handed to the witness.)

521 Mr. Lindley:

Q. You may mark that "Finch 1," so as to identify the sketch.

A. (Witness marking sketch.) As I understand it, and judging from the details of geology which I find in the workings of these mines under consideration, there was at one time,—because we do not need to begin at the beginning,—there was at one time a certain rock formation generally known here as the lode porphyry of the district, the rock formation from which the ore has mostly been produced. This rock formation, as is the case with volcanic rocks, usually, was not regular in formation, altogether, but, as a general thing, so far as I can determine, if a cross-section is taken north and south, which has been done on the large map on the wall, or, parallel with the glass sheets in Exhibit 3, this rock formation may be generally shown as a comparatively flat lying body, crossing the area which we are discussing. This drawing is intended to be only a diagram, but for the purpose of illustrating some of the steps in geological history. Underlying that rock were a variety of other rocks at some time in the history of the district. It is not necessary, I believe, to go into the differences of opinion as to the age of those rocks underlying this lode porphyry because the essential fact remains that the plane of meeting along the bottom of the lode porphyry, which I will mark "M. T.,"—which is the plane of meeting along its bottom with various other rocks, but mostly with one certain rock known as "West End Rhyolite,"—which I will now mark "W. E." for West End.

Q. Better add the "R," "West end Rhyolite."

A. Yes (indicating). A little area which I have outlined
522 in green to the left of the drawing may be considered as any

other one of several rocks which underlie the lode porphyry. It will be seen upon the drawing that at the bottom of the Midway trachyte there is an undulating line; although this does not represent in detail the occurrences in the ground, it, nevertheless, represents in a general way the actual conditions. At a certain time,—when, we do not know,—but a long time ago, along that irregular line there was caused a shattering of the rocks, induced doubtless, by any one of several volcanic disturbances which affected the district after this condition which I have just described had been developed. The shattering of the rock resulted in the crushing of the Midway trachyte,—the Mizpah trachyte,—or the lode porphyry, generally along the line of contact. There appears to have been just sufficient dislocation, or jogging, of the overlying rocks upon the underlying rocks to have caused a sufficient amount of indefinite fissuring, or fracturing, and in some cases a fracture passed across little depressions in the base of the Mizpah trachyte, leaving a certain amount of it below the zone of fracture; otherwise, it followed the contact very closely.

The blue is intended to represent just a step in the process, this zone of fracture having been formed at the base of a rock favorable for the reception of ore deposits, and this having been a volcanic region and still a region, probably, of considerable volcanic activity at the time which we have now reached,—solutions, and probably hot solutions, containing materials which usually go to make
523 up veins and ore deposits, began to circulate and spread along this zone of fracture. So, our lines, which we have represented in blue,—blue being used as a usual and conventional representation of cracks and faults and seams in the rock which are of mechanical nature only. This is replaced and filled, now, gradually, probably, with one definite period more or less closing, followed by another period of activity by some second or third disturbance of this line of weakness, reopening older deposits of vein quartz and filling—the cracks made in that, and new cracks made out into the country with additional quartz and additional ore minerals, and we finally have a vein which I am now drawing in red, of great uniformity and containing in it immense masses of quartz, much greater bodies of quartz than the other veins of the Tonopah District which I have seen. Now, within this broad band of quartz there are certain fractures, lines of fracture, mostly clinging closely to and in the quartz itself. Along this line the commercial minerals are formed, and outward from these lines, mostly from the contact, commercial minerals also extend, through the quartz, and outward in a ramifying, interlacing way, into the overlying Mizpah trachyte, which I am now indicating by the twisting streamers which run up from the plane of contact, penetrating veinlets of quartz extending out from the main vein of ore, usually termed by miners as quartz stringers. Downward in the foot-wall side, also, and particularly at certain points, there are stringers of the same nature and such an area as I have now indicated where that fracture cuts across and leaves a body of Mizpah trachyte or lode porphyry underneath the vein; those stringers are especially conspicuous. Also, at cer-

524 tain points in the West End Rhyolite, these stringers are quite conspicuous down in the foot-wall side, and, I might add, that although they are of no particular importance *un* tracing the continuity or fixing the identity of the vein under consideration, there are other fissures underneath the vein and in the underlying rocks which are of different age and have no significant connection with it. Such veins as these are found particularly on the 500 level of the West End, past where I am now indicating, in the region of the McQuillan shaft, cross-cutting through the West End Rhyolite; they have a general northeast and southwest direction and stand vertically; they have a different form and a different time of origin than the vein which we are discussing and they are not the quartz stringers which I am now representing as being genetically connected with the big contact vein. And there are certain other little details which will come out better in connection with some other steps, and I will mention them now. At the summit of undulations in the contact vein, where there is a sharp bend to pass in the slight movement of the overlying rock which caused this fissuring, there is in some places a special complexity of the cracking of the rock and the development of the quartz stringers which filled those cracks. Places such as that are found in the Jim Butler workings, and they have already been referred to in the region of the little anticlinal stope; other places are found which are very conspicuous. Over in the MacNamara where there is a very slight roll or undulation in the vein,—some in the position I am now indicating,—is a great
525 amount of fracturing, extending into the handing-wall in a number of quartz stringers. The vein, as it is drawn rudely upon the sketch, is now intended to be represented as complete. No more ore deposition took place in it. We find it not dipping, in general, very much in a north direction, nor in a south direction, but lying rather flat, taken as a whole, beyond the regions represented in the map, Exhibit No. 1. In that particular region we are considering we have this special prominent undulation which has been referred to as the crest of an anticline. Now the dip of this body, as a whole, is not in a north and south direction, or in either a north or south direction, but is, as a matter of fact, in an easterly direction, and this particular ridge can be seen by looking upward through the sheets in Exhibit No. 3. The ridge stands over, in my sketch, the letters "W. E. R." It is as if, just for illustration, you would take a sheet of corrugated iron, dip it downward and hold it by one end. The dip of a sheet of corrugated iron is downward along those ridges, and this ridge may be represented, may be spoken of as a ridge of such a nature and the dip of the body, in general, as eastward. The vein now having been formed in the shape which I have described, other volcanic disturbances took place, a certain amount of this Mizpah trachyte had been removed, a certain amount, probably a very large amount, of volcanic material fell—upon the surface, or flowed upon the surface, and covered the eroded Mizpah trachyte. Then, another long period elapsed, long in geological time, because we find in the workings of the mine this cap rock, the Midway andesite, had also been eroded in a sharp, mountain-side

526 slope, and *and* that the end of this vein westerly, as exhibited in Plaintiff's Echibit No. 4, had been sliced off and formed a conspicuous quartz outcrop on the slope of this hill. Being a large body of quartz, it was an unusually conspicuous outcrop; and after those long geological steps had been taken, still later disturbances, caused by the latest volcanic eruptions, concerning which we have no interest in this particular matter, except for the purpose which I am now going to state,—some of those very recent eruptions caused the disturbance of the rocks of the country so that faults were formed in various places,—some of these very conspicuous and important faults. One such fault cut through the remaining Mizpah trachyte overlying the vein, two cap rocks overlying that, and a great mass of country slid downward from the direction of the west end of the West End claim through its east end line and in a northeasterly direction, carried a great mass of over-riding rock in the direction of the Tonopah Mining Company territory. In doing so this fault was guided, to a very great extent, by two things; it sought, as a plane of weakness, or as a region of weakness, those rocks which are most easily broken, but its direction was deflected at certain points by very hard rocks, such as the quartz of this vein, which caused it to curve and take a direction which it might otherwise not have taken. This fault, which I will call the Siebert fault, on account of its possible or probably correspondence with such a fault over in the Tonopah Mining territory, had some such form as I now indicate. It probably broke into more than one plane at certain points, but in any event was a very distinct and pronounced fault, in which the
527 over-riding rocks downward, along the slope of this anticlinal, fell toward the east. Now, on the cross-section of the vein, a cross-section running north and south, as the planes of Exhibit 3,—this fault touches the vein only for a very short distance and only at approximately the summit of the ridge of the anticline, which passes eastward in the region of the north side-line of the West End claim.

Mr. Dickson:

Q. Point out on the model where that touches the vein, near the summit.

A. It touches it in the raises which have been,—at the foot of the raises which have been driven by the defendant company, and most of the raises,—that is, the A raises, which are closely grouped together, from 2A up to 7A and then in the A raise in the dome-shaped MacNamara stope, and at various points in the ground,—one of them I think you call Raise 3,——

Q. Raise 302.

A. (cont.). Raise 302, which is about in the middle of the model.

Mr. Dickson:

Q. Well, with Mr. Lindley's permission,—Do I understand then, in your opinion, Mr. Finch, that the Siebert fault, so called, touches this vein at the summit or crest of what you call the anticlinal fold from practically end to end?

A. I believe it does. The little block-model will illustrate it to the Court better than anything else, I believe.

Mr. Lindley:

Q. Referring to Exhibit 4?
A. Exhibit 4.

At this time an adjournment was taken until 2 o'clock P. M. December 14, 1914.

528 Afternoon Session, 2 o'Clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consoiidated Mining Company.
Mr. Lindley: Mr. Finch, will you resume the stand?

Direct Examination of JOHN W. FINCH, resumed.

Mr. Lindley:

(Q.) Mr. Finch, as the Court adjourned, you were about making some explanations, or developing your idea with reference to the conditions. Will you proceed at the point where we left off?

A. The Siebert fault was under consideration, and before leaving this diagram upon the wall, to make the conditions a little more precisely as they are, the Siebert fault in the trough-like portion of it, where it comes down, dipping toward the north east and in cross section dipping towards the north in the drawing, breaks into one or more of the branches at places. I will mark this main fault, the Siebert fault on the drawing so it will be identified.

It might be well now to consider some of the reasons why I know this to be a fault. In the first place, it is a prominent fissure containing materials which are commonly known to miners, as constituting materials of fault. It contains a tough, heavy clay gouge and in very consid- quantity. This gouge material is the product of the grinding of one mass of rock against another, and will vary, according to the rocks through which the fault passes in its
529 color and appearance, sometimes in its amount. Within the fault, as within all such——

Mr. Dickson:

(Q.) What is that?

A. Within the planes or walls or boundaries of the fault, and within the gouge, there are fragments of material which are so hard that they have been pulverized into the clay which is called the gouge. Such fragments, where the fault comes into the vicinity of the vein are usually fragments of quartz broken and rounded and smoothed by the movement of the over riding mass of rock upon them. Such fragments of quartz are usually termed drag quarts, as distinguished from vein matter found in place within the vein. Those two features are the marks of faulting.

The best proof of faulting, however, is in the determination of the dislocation of definite formations of rock, or features in the

rock which can be identified on the opposite sides of the fault. After the fault occurred, as shown in the sketch, "Finch No. 1," the Mizpah trachyte which had formerly existed here, and which, as I stated, had been to a certain extent eroded and overlaid by Midway andesite, was naturally faulted by this fault, as were the overlying rocks. If, then, a contact can be found between those two distinct rocks, on each side of the fault, the magnitude of the faulting, at least in the direction in which it is developed, can be found, and the magnitude of the faulting with a number of exposures of this kind in its greatest direction can be determined, if considered in connection with the marks of the direction of movement of the fault.

530 Now, we find underground in the mine in this fault, as it almost invariably the case with all faults, that there are marks in the direction of the movement. These marks are in the nature of grooves, striations, markings upon the wall of the fault, upon the rocks which overlie and underlie it.

These striations or grooves have a direction down the trough which the fault occupies in an easterly or somewhat north easterly direction, and are remarkably uniform over the entire area in which the fault is developed within the area covered by the model exhibit 2.

It is found by certain developments in the mine that the Midway andesite which covered an eroded surface of the Mizpah trachyte has dropped down from a certain elevation on the south side of the fault to a lower elevation on the north side of the fault, so that rock which was formerly Mizpah trachyte before the fault came on the north or overlying side of the fault has now become, to a certain extent, a Midway andesite, which I will indicate by the little cross marks.

Going further up along the dip of the fault into the still later and overlying formation, the Fraction dacite breccia, we find that the fault also cuts through that and also faults that rock. So the fact that it is a fault and that it is a fault of very considerable displacement is very distinctly shown.

Then, in addition to all those considerations, it is found that the stringer zone, or border zone overlying the main body of the vein has also been sliced off by the fault, where the fault descends

531 low enough to cut that zone, and at other points where the fault does not touch it, that zone still exists, which is still an additional reason or indication of faulting.

Mr. Lindley:

(Q.) While you are on that subject, Mr. Finch, I wish you would give, for the benefit of Court and Counsel, all the indicitia from which you infer the relationship that this fault bears to the hanging wall section of the West End MacNamara vein?

A. That portion of the West End MacNamara vein which is most nearly approached by the fault is the portion lying to the north of the ridge of the anticline and in the MacNamara territory. If I could persuade your Honor to sit in the witness *share* for a moment, I can explain that on the glass section model.

Q. Before you take up that model, and as a parenthetical question,

Mr. Finch, I wish you would explain that model, what the dotted lines are to indicate, and to what extent there is projection, and what is the data for that projection? Is there any distinctive mark on the model indicating actual observation from projected objects?

A. Yes.

532 Q. Now, will you explain to the Court just exactly what that model represents, and its construction, and what its purpose is, for the purpose of showing the difference between the dotted and solid line, and the data, from which the dotted lines were extended?

A. All the features in the glass cross section model, whether they be geological features or workings in the mine,—if they are cut by the plane of the section, they are shown in solid outline; if they are within a reasonable distance of the section, so that they can be represented in the section, and throw some light upon the geological conditions in the plane of the section, they are represented by dotted lines.

Mr. Dickson:

Q. Do they show the extent of the projection?

A. The plane will in each instance show the extent of projection.

Q. Does the glass show the extent of the projection?

A. It is not written in on the glass sheets, for the reason that on the plane map, the amount of projection is always clearly shown; if, for instance in cross section No. 7, it should be desired to show the geological features of the cross cut—running northerly from station 1155, it will be seen that that cross cut lay for a part of its distance very close to section 7, as shows precisely on the plane map, and where it enters the section it will be shown in solid outline; where it is near the section but not exactly on it, it is shown in dotted lines.

Mr. Lindley:

Q. In all cases the dotted lines show the projection from known data?

A. Yes.

Q. Now, explain generally the situation as to that model, the glass section?

533 A. I am going to explain the principle upon which the plan of the glass model was made.

Q. Mark that "Finch-2" please.

A. (Marking.) And make this explanation for the purpose of showing how geological features in the ground are represented in the cross sections, as distinguished from the representation of mine workings. If we have, say, a shaft sunk in the earth, (indicating) if from that shaft a level is driven, as I now indicate and at the end of the cross cut on that level there be a drift on the vein; if at another point lower down, there be another level driven, as is customary in mining, and a cross cut is driven in the opposite direction, say,—it does not always stay in this line of section, but somewhere near it, we represent that cross cut with dotted lines, until we reach a point out here where there is a drift showing the vein. If after-

wards a shaft be driven and ore taken out of the vein above the level it is usually taken upward from the level, as I indicate now in the cross section,—this being a plane transversely or across the stope; now, if, in all that development the miner has found that he has a vein on the first level, which dips as I now indicate,—if in sinking his shaft he finds that he has a vein here, and in driving his stope and doing his drifting on the lower level he develops his vein in this form,—now it is true so far as the miner or expert or any man can see that vein is the limits of those workings, as they are drawn upon that sketch, but it is absolutely obvious, there being no vein further down the shaft, and no vein further up the shaft, or in these workings that that vein is the same vein; where a geologist, or miner, for that matter, connects those segments by a dotted line, and the
534 geology is therefore represented, and the sketch is intended to represent it better than the cross section has on the wooden model, which merely shows the opening, because the vein cannot be shown to connect in reasonable form.

Q. Then, the reason of the connection can be examined and determined from the relation of the dotted lines to the solid lines?

A. Yes; the geological formation-, such as rock formations are represented in the same way, and with respect to the representations on this glass model, I will state that where the contact between two rocks is developed in a certain working, that is on a section, it is shown definitely and exactly; where between points of development it is hypothetical but still reasonable it is represented by dotted lines as in the case of the vein which I illustrated; and in the construction of this glass model we have data secured to and fro all through the model as to the position of these certain rocks; that data is connected up in a reasonable way, if for instance on the Siebert Fault a certain amount of displacement is shown at one point, that displacement is shown at all points, as it must be.

Q. Well, now, that explanation for the purposes and functions of that model, and the differences between the solid markings and the dotted markings, you may continue with your explanation.

A. As I understand it you wish me to explain the relations of the Sibert Fault to the vein,—was that the question?

Q. Yes. I wish to know all of the data and all of the explanations which you have which explains the relative position that that Siebert fault occupies to the hanging wall section of this vein?

535 A. These series of cross sections show, the Siebert Fault, with blue line markings, practically the plane or fault. Sometimes it is one plane, the gouge, and sometimes it is two, and the points where it is of two branches are developed at various places in the mine. It will be seen by selecting a line of vision, down towards the bottom of the model that there is a close correspondence all the way through forming a trough, shaped surface over the fault; that the fault has trough shaped form. Now beginning at the east end, the vein has been developed in stopes which are indicated upon the model on the right half of that sheet; other developments upon the vein over and continuously on the solid mass of quartz of the vein

in the point where it turned over in dipping in the opposite direction, very slightly in the McNamara is also shown. Now, a close observation of the model will show not only the design for the rocks but certain little dashes and lines of red which are the halo or zone of stringers extending into the hanging wall. The vein and the fault are both developed definitely in the cross section. A certain raise which has been called Raise 488 on this cross section No. 1 is driven upon the fault now. In its original condition it cross cut through the fault, but the fault now shows its entire length practically; it is a distance of some forty feet from the fault downward to the main or solid part of the vein; in this section, in other words, where the development is exact the fault is not in contact with the vein, and there is a considerable intervening body of the hanging wall country rock, filled with stringers.

On cross section No. 2 there are a series of workings shown; those shown solid are actually in the section and are the direction of
536 the fault, their progress westward impinging upon that northerly slope of the summit of the anticline; and, — rising against it a solid streak of quartz which bent up a little more sharply than usual on both sides of the incline, and it has some distance below it other streaks of the vein which are solid quartz; here the vein, in other words, is in contact with the quartz for a certain distance, but in passing northward towards the workings of the Tonopah Mining Company development upon the fault, near at hand to this section as shown, it *has* departs from the vein, and there is country rock between it and the vein.

537 Cross section No. 3 is a very thoroughly developed cross section in which a stope upon a streak or strand of the main vein has been followed in the operations of the West End Mining Company, and have passed the summit of the anticline downward to a certain extent towards the MacNamara territory. The fault is here in coincidence with the summit of the anticline and downward on the slope for a certain distance.

Then, workings in the MacNamara and Tonopah Mining Company show the position of the fault to be above the vein. I can show that also on the plan map later.

On section No. 4, the fault is in coincidence with the vein near the summit, and down the slope of the MacNamara side of the anticline for a distance of some 200 feet, at about which point it departs and leaves a mass of the hanging wall trachyte between it and the vein.

Section No. 5 shows the fault in contact with the vein at slightly lower point in the MacNamara, but as you go northward, departing on its dip and running up into the hanging wall rock.

Section No. 6 shows the fault not in contact along the ridge, but in contact a little lower down at a point; but throughout the distance of development upon it, not over 20 per cent of the development showing the fault in contact with the vein, and not over 6 or 7 per cent of the actual length of the fault in the plane of the section in contact with the vein.

Section No. 7 shows a condition of considerable coincidence of the

fault with the vein in the MacNamara workings, but probably
538 not at the summit, not entirely developed at the summit.

Then, Sections No. 8, 9, and 10 show similar conditions of coincidence in fault with the vein at points as, for instance, here (indicating), large masses of hanging wall country rock lying between them at other points.

Q. In other words, the fault departs from the vein as you go away from it?

A. Yes, the fault is guided in a very general way by the high points on the vein. But the fault cuts off or removes very little, if any, of the solid part of the vein, but it does carry away from the hanging wall side of the vein along the crest of the ridge and slopes northward from it quite an area at places, as would be indicated in any of these sections of the stringer zone above the vein, but that is all it does remove apparently.

Next there are two sections, 11 and 12, which show the development of the fault in contact with the vein for a distance similar to those in the east end of the mine, and still more detailed development of the fault passing upward and leaving the vein into the west end ground.

This development has been done in raise A, heretofore referred to in the testimony of the Defendant.

Now, all of those points are shown upon Exhibit 2. The last point, raise A shown upon this model, as upon the model of the Defendant, and the fault is indicated in blue running up the raise. The same fault is developed in the raise which, for convenience, I will call the side line raise, I do not know what number it is, 152,
and it developed for a considerable distance, some 200 or more
539 feet in that raise, and in the working connecting with the bottom of the raise, and is shown in blue upon the model.

Now, at this particular point, it may be of interest to show the actual direction of that trough which the fault occupied in a general way, and it is somewhat as I now hold the pointer.

Mr. Lindley:

(Q.) Can you give the terminal points there by the numbers on the model, so that we can get it in the record?

A. Well, the north easterly direction of the fault is shown by the striation, and it is very nearly on the dip of the fault and the direction of the trough, I now indicate with the pointer, starting at the top towards the west top or apex of the vein, towards the western continuation of the fault, b-yond the vein, in raise A, down into the workings of the MacNamara and through a point on the 500 level of the Tonopah Mining Company, where the fault is clearly developed, showing the downthrow of the overlying cap rock into j-xtaposition with the Mizpah trachyte, And that point is near the point shown upon the model where the numbers 500 C. M. are indicated.

Q. What does that represent? The trough, or syncline of the trough?

A. Yes.

Q. Represents the syncline or the bottom of the trough?

A. Yes. Yes, that is the depression. If it were a solid surface, it is the line along which a stream of water would flow.

Q. Now, you have spoken of raise A and the conditions in raise A. I wish you would correlate that with the conditions in a
540 series of raises which you say were put up on the fault indicated upon the model from 2 A to 7 A?

A. That question can be answered in a simple statement, I think. The conditions are identical. Each of the raises, A raise, 2 raise, 5 raise, 4 raise, 7 raise dev-lop the fault upward beyond the summit of the anticline and into the overhanging country rock.

Q. Explain what is shown in the raises made up there to indicate that the material in there is—the character of the material? Please explain the character of the material in those raises, and to what extent they are vein material, or if they are vein material, to what vein it belongs, and how the fault cuts it?

A. The fault lies along the top of the raises and has crossed the surface of the solid quartz of the anticlinal vein. The materials of the fault are shown in the gouge or clay and the included fragments of quartz. The faults in any one of those raises may be represented as a fissure which cuts across various planes of cracking in the rock, in which streamers of quartz had extended up from the main body of quartz below in the main anticlinal vein, as I now indicate.

Q. Mark the left hand section there A, and the other one B. Your last remarks apply to the sketch B on "6 No. 2"?

A. Yes. Now, in one of the raises, 5 A, near its top, a conspicuous band of quartz has been found, which, when we construct all these things, mathematically, consistently together, we find to be the Fraction vein. The Fraction vein is found in that raise taking a form as I now indicate. There is one form of what the
541 miner and the geologist both call drag, indicates the direction of the faulting. Down here along the raise at various points in the clay gouge are found fragments not only of this Fraction vein, but of any other seams which extended up across, which the fault cut in its course. So that in those raises there is a considerable appearance of quartz.

Mr. Dickson:

(Q.) Considerable what?

A. Considerable appearance of quartz partly at the top of 5 A raise, where it cuts the Fraction vein. The quartz increases somewhat in all these raises, taken as a general thing, as you get down towards the main body. In 4 A raise, for instance, a very considerable body of quartz which does not look especially rich, but still is, nevertheless, a part of the vein; a considerable body of quartz which runs up something as I now diagram it, and is cut by the Siebert fault, as are all the other bodies of quartz in all those raises, none of them are parallel with or conform with, or show any relation to the fault plane, except that they are cut off by the fault plane.

Incidentally, those raises also show, some of them, 5 A especially, the overlying Midway andesite cap rock which has been brought down by the fault over the Mizpah trachyte, the rock under the fault being a Mizpah trachyte or lode porphyry. That condition represents in a diagrammatic way the condition in each of the raises hitherto described.

In answer to the question, 302 raise shows a similar condition, and much more extensive development of the same condition. It not only develops the fault up away from the hanging wall, but it also develops the fault for a long distance up into the
542 Midway andesite, showing its age with reference to that rock. Raise 488—I do not understand the question went into that.

Q. Well, you may proceed on your own suggestion there.

A. That differs from the other raises in the fact that it does not start on the main vein, but starts up from the stringer zone, and in the stringer zone and therefore in the country rock, and follows the fault up to the Midway contact. That raise would be in all its essential features, like the middle regions of such a raise as 5 A, but it is starting in at a certain point, as I remember the exact distance was something like 27 feet up the raise, where the fault comes in clearly developed, and then a little space in which it is not developed, and it is shown again in the tip of a working running north at the level from the foot of the raise; then at about that same point a seam of partly replaced country rock, fissure material older than the fault is developed up the raise to the end of it, and at the end of it, this seam of quartz, if it may be regarded as continuous, is cut off by the fault, so that it has its two ends in the raise, an upper and a lower end.

Q. This Siebert fault, as I understand you, is the latest phenomena, geologically speaking, that occurred in that section of the country? It was after the formation of the vein?

A. Yes. It is later than anything else except possibly one thing up near the top of the McQuillan shaft, is a little Oddie rhyolite, so called. I assume that it is Oddie rhyolite, because Mr. Spurr states that it is. That might be later than the Siebert fault,
543 from the date which we have at hand.

Q. It has no connection with the vein?

A. None whatever. The fraction dacite breccia underlies that.

Q. And the quartz in this fault, as I understand you, was quartz which appears through the operation of the fault after the creation of the vein?

A. Yes; long after the creation of the vein.

Q. In other words, the fault is a postmineral fault?

A. It is, yes. There are two or three other definite points which before the subject is——

Q. I wish you would bring out in your testimony every indicia that there is to justify your deductions that this is a post mineral fault, that the quartz shown in it is the hanging wall segments that are cut by it of the main vein which lies below.

A. I think it would help to make the matter clear if in answer

to your former question the definite points were shown upon the big plan map.

Q. Very well. Just take those points and present the matter from that.

A. We can start, for instance, at the 300 level of the West End, in an immense body of quartz which turns around in horseshoe form at the east end of the 300 level, and is the eastward dipping ridge of the anticline, as it will show on a level.

Passing through that body of quartz, we find the Siebert fault, as it customary, near the summit of the anticline in contact with it. A raise has been d-iven upon the fault, which I under-
544 stand has been called raise 302, and connects up with a very old raise which is driven along the fault itself practically its entire length.

Following upward along this old raise, we trace the fault in the Midway andesite or cap rock, and at very short intervals is seen passing westward along the drift which is marked 202 on this map, and we follow it continuously along that drift, or practically so, near enough so that there is no question about it.

Then going over into the MacNamara 200 level, which is connected directly with 200 of the West End, the fault is again picked up in its proper position upon drifts that are shown in that level and along and near the crest of the anticline. We follow along a drift where the two are in coincidence to a point marked M 41 on the 200 level of the MacNamara, where the vein on its strike, is shown departing from the fault—the fault is shown departing from the vein. The fault being developed in a drift 45 C, the vein is exposed running westward in drifts along which the words MacNamara 200 is shown upon the map.

Q. Leaving the plane of the fault?

A. Yes. At the level which is named upon this map MacNamara 186, the drift or level is all in the vein, except the two tip ends of it. At the west end is a fraction dacite breccia. At the east end, the vein encounters the fault. The fault, the direction of it is practically shown by the little face towards the northwest in its strike. And this is another point where the fault departs from the vein in its strike, as it did upon the cross section model upon its dip.

Passing upward, you can walk continuously through the
545 curved or a-ched stope of the MacNamara to the foot of 2 A raise. Here the fault is again picked up and the raise——

Q. A raise?

A. A raise it is called. This raise, by the way, comes up diagonally on the dip of the fault. Does not follow its exact dip. Its dip, as a matter of fact, is about as I now indicate, and in a direction almost exactly parellel with the west end north side line, and not in the direction parellel with the dip of the MacNamara vein towards the north.

Q. A diagonal upraise?

A. Yes. Then, in this immediate vicinity, it is also possible to

pass up the raise marked upon this map as a raise between 195 intermediate and 136 intermediate called 152.

Q. Let us be sure about that. I think that is marked on that other model. That is correct, 152. Kindly put your initial F, over that marking so we will know by whom it was made.

A. The fault is followed up that raise, also followed eastward down along a very high cross cut, in the back of which the fault shows for most of the distance along the edge of a drift shown in green here, 195 intermediate, and backward to the point of beginning through which I started to make this tracing of the fault. But going upward from the 195 intermediate, it has followed up the raise to some little intermediate levels numbered upon the map 136, intermediate 166, intermediate 195; they are a continuation of the same level. Strike that out. 195 is not a part of the upper working. 172 inter-
546 mediate. The 136 and the 172 intermediates connecting with the Porcupine shaft, and upon the little levels shown upon this model and marked 166 and 172. The fault is shown passing up to 136, where it enters the fraction dacite breccia. The vein entered by other raises from the 195 level is shown to pass a long distance below the dip of the fault separated by an interval of 50 feet or more of the hanging wall rock, and is shown passing up and entering—the fraction dacite breccia.

The fault is also shown cutting into the fraction dacite breccia, and showing that it is younger, even, than that rock. So the
547 fault is found at many points to depart on its dip and strike from the vein, and it is so found at the majority of points.

Q. Will you select from the different cross section-, which I understand from you are drawn one hundred feet apart, paraliel to each other, the section which most clearly shows or in which it is demonstrated, the displacement of the rock by this fault?

A. Yes, it is shown very well in section No. 2,—the displacement of the Midway andesite.

Q. Have you a similar section on drawing paper?

A. I think so. (Producing section.)

Q. This is a reproduction of section two as shown by the glass model?

A. Yes, it is identical with the glass model.

Q. Will you take that section and explain to the court the result of the fault and its dislocation of the rock?

A. First, it might help to explain, that the cross section passes in a northerly and southerly direction, not far away from the McQuillan shaft, across a number of workings and the 400 level of the Jim Butler, and is in about the position indicated here upon the model. The workings in the Jim Butler to which I refer being where the pointer rests. The Midway andesite is shown in those Jim Butler workings which are marked 400 Jim Butler upon the cross section,—shown just a very few feet away from the plane of cross section, running along the roof of the drift, and there is a considerable development of it showing its form and its dip. Other workings near at hand also show that it has near this point a dip, first towards the south and then turning up towards the north; on the other

548 side of fault, on the other hand, on the north side of the fault, we find the Midway going down the McQuillan shaft to a certain point, which is, as I recall, similar to the point indicated by section-B of the defendant. It is also shown in the back of 5-A raise, and a great number of points in this immediate vicinity show at the top of the raise, upon the West End 422-A, as I recall,——

Q. B?

A. 422-B. driven upon the Fraction vein up to the Midway Andesite, showing that the configuration of the Midway Andesite on each side of the fault is similar. The amount of displacement by the fault is therefore determined on this cross section between the points A and B.

Q. Mark for identification "Finch-3."

A. (Indicating.) This cross section is confirmed by similar cross sections at other points in the mine, so that there will be no confusion about that, so that there will be no possible confusion, it might be better to put the A on the other side of the fault, showing the amount of throw on the contact between the Midway Andesite and Mizpah trachyte.

Q. Will you kindly bear in mind that Judge Dickson is a little hard of hearing.

A. Yes. Shall I repeat that.

Q. Yes.

A. Showing the amount of throw on the contact between the Midway Andesite and the Mizpah trachyte, which is one of the best lines of reference that can be found in the ground a contact between two rocks.

Q. Now, can you recall the particular section with reference to our system of marking the sections where this same condition may appear?

A. Section No. 1 is an excellent development of the same thing.

549 Q. That is one hundred feet to the east of this section is it not?

A. Yes, that shows the raise,——

Q. Mark that "Finch-4" please.

A. (Witness marking exhibit.)

Q. That is a reproduction of section one in the glass model?

A. Yes, identical, except that the glass model is a little nicer in its drawing. The lines are the same however. The raise to which I refer and pointed out on the skeleton model as having been driven by the West End company, up to the point where the Fraction Vein runs into the Midway Andesite, is extended to some distance in Midway Andesite towards the east, and the section crossed it at such a point and shows the contact of the Midway Andesite with the Mizpah Trachyte, and also shows the dip of the trachyte, an almost horizontal dip taken as an average between the dip shown at the top of this working, and the dip of it to a certain distance towards the south in the Jim Butler near at hand; the top of 488 raise,—not numbered upon this section but referred to upon the model as the raise starting in the hanging wall trachyte stringer zone,—develops the bottom of

the Midway Andesite resting upon the Mizpah trachyte on the hanging wall side of the fault; that is another case *there* the definite throw of the fault is shown in a north and south direction, as it was in the Exhibit marked "Finch-3" and I have upon the same lines A-B on this cross section marked the points indicating that throw.

Now, it might be well to explain in that connection that this is not the greatest displacement of the fault; it- greatest displacement is naturally in the direction of the fault. These are only components of the throw of the fault measured in a north and south
550 direction, where the throw or displacement is almost the least throw or displacement caused by the fault.

Q. In other words you have to have two components to determine the extent of the throw?

A. Well, there is a direction of greatest displacement, which if measured along the fault, is measured in the direction of the movement; a cross section if taken there in any other direction shortens the amount of that movement along the plane of the fault.

Q. Well, in order to determine the direction of the movement, how many components is necessary,—the direction and extent of the movement?

A. If you take no striation to a great number of points where displacement is shown, the longest displacement shown would be the nearest to the direction of the movement.

Q. Where do you say that the greatest indication of movement and dislocation of the rock is shown?

A. It is shown by the direction of the striation.

Q. Where?

A. Almost at every point where the fault is developed. We have no developments that I can recall, which would show definitely the amount of displacement along the direction of the throw of the fault, but we do know that the amount of displacement is greater than the distance measured from A to B on this cross section.

Q. Now, have you anything further to suggest by way of the observed facts in your mind to determine the character of this fault or its relative position, other than what you have testified to?

A. There is only, if I may be permitted to use a study drawing, which I have used in the preparation and suggesting the preparation of the geology upon these exhibits,—I can show another
551 incident which is a little more comprehensive.

Q. You may—anything by way of illustrating your testimony, Mr. Finch.

A. (Witness producing drawing.) This is not a complete map, but one,—for the moment I would like to bring that up here. The light shines upon it so that the court cannot see it at all.

Q. Mark that "Finch-5."

A. This is a plan of the 400 level of the West End and the connecting level on the McNamara side; it is represented on the main plan map, Exhibit 1, in the red coloring, and can be followed around in the horseshoe shape on the map. This is not an absolutely complete map, because it does not embody the last surveys, but which were merely matters about minor details, but it does show the form

of the anticline as it appeared on the plan map, and is developed continuously from a point in the Tonopah Mining Company property around through the McNamara and through the curve on the 400 level of the West End. Now the Siebert Fault is shown in the heavy blue line, meeting the main vein for a little distance in the vicinity of the McQuillan shaft. Then this trachyte hanging wall is found for a distance beyond that; the trachyte hanging filled with stringers. Then it meets the vein again and then little segments of vein, little areas of trachyte showing that the vein,—the form of the vein, had already been made and its irregularities out into the country had already been formed before this fault cut along. Then, at a point marked on this Exhibit "T-16" is another exact point of the departure of the fault from the vein and at this point leaves,
552 takes its departure forever, as far as we know in the area of this map, from any coincidence with the vein. The Tonopah Mining level is a short distance, about fifteen feet below the MacNamara level, and a zig zag line has been shown that they are not at the same elevation; the vein is shown again on the Tonopah Mining level, marked red at T-13, a distance of over 100 feet in a cross cut to the east, is necessary in a cross cut, before the Siebert Fault is exposed, and that is a similar point to that to which I have previously referred as a point where the Midway andesite dragged down toward the south in the Mizpah trachyte; and that illustrates, I think, about all that I can say of the relation of the two.

Q. Is there anything, Mr. Finch, in the fillings in that north side of the anticline and the south side, that would indicate any different period of mineralization?

A. No, I did not notice any; I saw a great many things to indicate exactly the same period of mineralization.

Q. Will you compare the conditions existing on the vein, as exposed in the underground workings on the south side of the anticline, and on the north side?

A. They contain the same vein quartz on both sides,—contain the same silver minerals and have the same appearance.

Q. How is it with regard to the size of the vein?

A. The size of the vein is quite variable, shown upon any individual cross section which may be produced, on both sides of the vein,—but there is no difference in general between the two sides; the same character of hanging wall, where the hanging wall has not been cut out by the stopes; the same character of foot wall where the foot wall rocks are the same.

Q. You say where the hanging wall has not been cut off?

552*a* A. Where the hanging wall stringers had not been cut away from the vein.

Q. Do you find a line of demarcation, of hanging wall, a clean cut separation in the nature of a gouge, representing the hanging wall on either the north or south openings of the vein?

A. There is no definite hanging or foot wall for this vein at any point; so far as the miner is concerned he doubtless refers to the hanging wall of his *of his* ore at certain points, and they may call that the hanging wall, but in all these stopes that I have seen in the

West End, or the MacNamara, where these Siebert Faults do not open up the tops of the stopes, there is a continuation of vein matter which the miner will not take out and sell because it does not assay enough, but that is just as strictly a part of the vein as the ore itself.

Q. Without any line of demarcation between them?

A. Yes. There is sometimes a certain line of demarcation between the stope,—that is taking the northwesterly portion of stope one, which has been referred to as the MacNamara stope, and which crossed over the ridge in the West End,—now there is a stope which has a sort of wall, but there is no gouge upon the wall; it is a hard rock surface, and the ore which the miner broke, broke with the wall and it is the same both sides of the ridge; down in the MacNamara that is the characteristic wall of the stope.

Mr. Dickson:

Q. What is its characteristics?

A. A hard rock wall; a parting without gouge in appreciable quantities and without gouge which compares with gouge in the faults such as the Siebert fault; down in the southeast corner of Exhibit-1 the large stope in the vicinity of the 500 level and upward continuously, contains the same sort of wall a hard wall
552*b* off which the ore breaks, and beyond that more vein, but an indefinite boundary which has not in many places been developed; there are certain bands in the veins on both sides of the roll; in the MacNamara there is one case in which two bands of ore are stoped, one above another, and an intervening layer, a great part of the vein left standing. In the Jim Butler workings there are bands as represented upon Section No. 2 in the glass model, and more than one band developing continuously upward to the 400 level; now one of these bands is up in the trachyte and another is a very definite band and sometimes very rich to all appearances, which follows exactly on the West End rhyolite contact of the Mizpah trachyte; so, these bands of solid trachyte are commercial ore, and are identical features to the top of the incline, and pass from the top of the incline and intervening between them are these same stringers which spread out in the hanging wall and in the foot wall.

Q. Have you anything further to note with reference to the characteristics of this vein, with reference to its habit?

A. I might state that the boundaries of the vein are, as I suggested somewhat obscure, until within the proportions of exhibits, such as exhibit-2,—it is necessary to take a certain arbitrary line which we believe and it was purported to be a fair line of demarcation of a considerable amount of quartz, and there may be quartz extending beyond, and it may include some areas as included in the lighter color upon this exhibit, marked "Finch-5,"—some areas which contain quartz and trachyte mixed, and yet within the walls of the vein, because it is very often bounded on both sides by streaks of ore. The model Exhibit-2, of necessity, since it is impossible to represent upon that the little details shown on an exhibit
552*c* such as number two, the vein is represented in solid red.

Q. Represents the excavations on the vein?

A. Yes. Where in that section it exhibits the solid red is only carried in the solid part of the quartz, and the criss cross for the less mineralized parts of the vein.

Q. Well, is the result of the Siebert Faults with reference to the scoring or contact with the upper section of this vein, correctly delineated on Plaintiff's Exhibit-3?

A. Yes, it is.

Q. And that is the deduction from all the exposed data?

A. Yes.

Q. Do you find anywhere along the anticline, or in the neighborhood of the anticline of this vein, any indication of a separation between the two parts or a movement in any direction between the north and south legs of the vein,—show a cleavage between the north and south parts?

A. No; the only thing that is shown is well illustrated upon section No.-2; this vein has had a long geological history and, as I stated it has passed through several volcanic eruptions, and it has naturally been shaken up somewhat, and all through the mine there are little cracks and crevices and little slits which have not been a disturbing factor to the miner, but which do dislocate the quartz body a few feet at a time. That is not confined to the summit of the anticline.

Q. Point out some of those conditions in the workings of the West End?

A. On section No.-2 there are little dislocations of the solid quartz ore streak, shown in the model on the three streaks at the summit; they amount to a foot or eighteen inches in some cases; down
552*d* in the stopes of the Jim Butler they are much more accentuated because of this line, as shown by the blue line in the west hand portion of section No.-2,—the marks "Finch No.-3." Over in the MacNamara there are quite a series of these near at hand; one of the best illustration- of that is on section No. 6; I have not a separate sheet of that, but Judge, I can show you here. (Indicating) section No.-6; do you see the little blue line run through the vein which is displaced a maximum of three feet through that region, and as little as eighteen inches or so, and over and over again every few feet quartz with little cracks in it, caused by fissuring, by cross fissuring. Section No.-5, a stope very near at hand, shows those little fault seams, shows those little fractures, earlier than the Siebert fault, and cut off by the Siebert fault, running up in a westerly direction along the stope as I now indicate it. The actual cutting off of those cross fractures by the Siebert fault is shown in that stope in a number of places.

Q. You are now referring to a stope which you may mark "Finch Exhibit-6" which is practically a reproduction of section-5 of the glass model?

A. Yes, it shows the same series only not quite so many of them. To make the statement comprehensive in the extreme, this is the same as section No. 13 in the glass model, and I shall not say anything about it which could not also be said about the glass sheet. There are also little cross fractures in the MacNamara stope at that

point and in the region here indicated upon the plan map of the stopes. On section 13,——

Q. Mark that "Finch-7."

A. (Indicating.) Now, this cross section then indicates another feature of some interest indicates another undulation of the vein on its dip; the cross fractures there have not been a source of any considerable disturbance to the miner in his stopeing, and they do not entirely displace the vein; the vein is practically continuous and can be followed with no difficulty whatever, notwithstanding the fact that there are throws of ten and as much as fifteen or more feet by those slight dislocations.

553 Q. Now, Mr. Finch, I would like to take you to the western terminus of this vein, as I understood your explanation, it terminates up against the fraction dacite breccia, and at the end, or what we call the terminal edge of the vein occupied at one time the position of an outcrop exposed to the surface. I wish you would explain that condition, and in making the explanation, instead of requiring me to ask question-, from time to time, if you determine that this is a terminal edge, and was the exposed edge at one time of an outcrop of a vein, give all the reasons why you make that statement, commencing with the geological conditions which preceded the covering up of the vein? You might refer, perhaps, to the red model, or either model that you please.

A. I will make only one reference as a preliminary to exhibit No. 2, which is the skeleton model. I have turned the model now so that the west end of it is toward the Court. It will be noted that at this west end of the model there are a number of points at which the bright yellow color is used. All those places in the workings are developments of the fraction dacite breccia. It is easy to see that from the skeleton model those workings, although they are near together, which are colored in yellow, do not of themselves construct without the aid——

Mr. Dickson:

(Q.) Do not what?

A. Do not of themselves construct a su-face which is continuous, but they are sufficient in number so that there is no great difficulty in reproducing such a surface. Much less latitude has been taken in the reproduction of this surface because it is really very

554 well developed than is taken ordinarily in the construction of geological maps.

The geological incidents preceding the development of this old surface or hillside have already been referred to, but to summarize them, they are these: a long time ago, in geological terms, a vein was formed at the base of the Mizpah trachyte. The Mizpah trachyte was exposed as a surface of the earth, and was worn down by the atmosphere, the storms, and carried away, leaving a rough topography, as we had in certain regions near at hand right now and caused by the same processes. Then, over that was scattered—over that was laid the rocks referred to by Defendant's witness as the lower cap rock, referred hitherto in my statements as the Midway

andesite, and shown upon these section exhibits and all other exhibits as the purple; shown as purple in exhibit No. 2, and marked with the initials "MA" in the cross sections in the glass model. After this rock had been laid upon the ground, another long period of erosion took place in which the hills and ridges and slopes were formed, and incidentally to that long period of erosion, a hillside was formed sloping towards the south west, and that hillside is reconstructed upon the block model in the surface which is colored yellow.

The data for the construction of that surface is considerable. Although in this model, for purposes of simplicity, and for other reasons which I will later state, as it then existed before any of the considerable fauiting took place, has been reconstructed. It is approximately correct, and below a certain line about where I now
555 hold the scale, it has not been disturbed materially since it existed in the form shown upon the model.

Below that line which I have indicated, which is roughly the line of the Siebert fault, is the outcrop of the vein. This outcrop has not been disturbed except by such little dislocations as these which are shown at varying points in the cross section. Those little dislocations on this scale of model have been ignored, because the continuity of the vein has not been affected by them.

It is found in the mine that raises—well, first, it is found that a great many developments in the mine have been extended along the vein until they have encountered the meeting point of the vein with the fraction dacite breccia. Those I shall have to point out on the maps, or upon the model, which is equally good for that purpose. The porcupine shaft is sunk in the fraction dacite breccia. The level marked 236 upon the model, the upper level from the Porcupine shaft is run in the fraction dacite breccia. The two little levels indicated upon the map are also run into that, but they were evidently developed by raises upon the vein which show points where the vein meets the fraction dacite breccia, and develop it for considerable distances along its actual outcrop under the fraction dacite breccia. Downward in the mine there are other workings which extend up from the roof of the stopes, or from levels which pass through the vein and up out of the wall of the vein into the fraction dacite breccia, showing how thick it was at certain points over the hanging wall of the vein back in this easterly direction away from the outcrop. Such points are, for instance, raise 250, as marked upon ex-
556 hibit 1.

Another point of very considerable interest is down in the stope between the 300 and 400 levels of the West End, where the fraction dacite breccia rests upon the actual hanging wall of the vein. There are other points down along a certain line towards the southward which indicate that along this particular line there was a gulch.

Mr. Dickson:

(Q.) Can you point that place out on the map?

A. That shows very nicely on exhibit 2, where the yellow band

is shown along the top of the stope. The configuration of this surface, after using all the points of developement, such as at the west end of the 500 level, where the yellow is shown on exhibit 2, the west end on the 600 level, and the tops of the raises, for instance, in 440 raise, driven upon the so-called south vein, and under the surface of the fraction breccia, as developed, and therefore the form of the surface indicated before the fraction breccia was deposited is shown. The little gulch as indicated flows down and uncovers the vein back in the old Midway rocks and along the gulch which flows down in a general direction toward the west end of the 600 level. And the outcrop itself is shown in the red line upon the model.

Mr. Lindley:

(Q.) As I understand you, that outcrop is not the result of faulting or exposure of that, but the result of ordinary erosion?

A. Yes, and the reasons for that are these: at every point where the end of the vein, or terminal edge of the vein is found in contact with these loose, fragmental fraction breccias, the vein is
557 found stained as the result of oxidation by exposure to the surface of the earth, just precisely as outcrops up along the Mizpah were stained at the time when the district was first discovered.

Q. You hold in your hand that piece of rock, a sample which—have you identified it by number?

A. No, I am using this rock merely as an illustration. I do not know whether it even came from this or not, but it does represent the stain which quartz has at the outcrop of a vein.

Mr. Dickson:

(Q.) Where did this come from, do you know?

A. I don't know.

Mr. Lindley :

(Q.) You are using that simply which you are now marking as "Finch 8" as an illustration?

A. Yes. I am marking it "Finch 8" upon the quartz.

Q. You do not know where that particular sample came from?

A. No.

Q. You are simply using that as a sample of oxidation where a vein is exposed to the surface?

A. Yes. That oxidation extends for a considerable distance into the vein, a distance which is the reasonable and proper distance for such oxidation to extend from any surface of a vein. Certain workings—for instance, at the west end of the 600 level and in the 300 level of the west end, where it is shown here a stope ends, and the yellow color begins around a curving drift over toward the Ohio mine, at that point and in the 165 level and in 173 level, the broken, shattered, stained outcrop of the vein in place is shown, but
558 more than that, the float which existed on the surface of the earth when this volcanic eruption covered it is seen lying down and scattered below the solid outcrop.

Q. And included within the later eruptive rock?

A. Yes. The development of it, I might say, is as vivid as if it were on the surface at the present day at these points.

559 J. W. FINCH.

Further direct.

Mr. Lindley:

Q. You were describing the oxidization of this ancient outcrop. I will ask you to state whether or no you observed that oxidized condition of the quartz in any other section of the mine?

A. Yes, there is oxidization in certain points where *where* there should be.

Q. Where is that?

A. On or near the base of the Midway andesite in places where there was also a surface exposed at one time; some oxidation down in the McNamara region, where we are near the old sub Midway surface; and in the vein in all that region where it is buried by any thickness of Mizpah trachyte, and where there was not a surface there was no such oxidation.

Q. To what extent does that oxidation appear along the line of this original outcrop?

A. At every point where this original outcrop has been exposed, and it appears in a very marked degree,—I have picked up another specimen which I will mark "Finch-8" if you do not object.

Q. No, we do not object. Where did that come from?

A. I do not know, it shows a fragment of quartz where the vein ceased to be a vein in place, and where it begins to be a mixture of float and loose rock and cemented together by the usual cementing material near the surface.

The Court: That should be "Finch-9."

A. Finch-9, (marking same) and as to the extent of it it is very marked everywhere, where the buried outcrop is exposed, but probably the intensest iron stain is at the 600 foot level near the west end of it, and that the deepest point below the present surface of
560 the earth, where the condition has been developed in the mine. In other words, if I may be able to pass to a conclusion from that, the oxidation in no respect shows that it is an oxidation produced by present conditions, but that it was formed before the Fraction dacite breccia was formed, and it is quite, or in this particular case, more prominent at the deepest point where it is developed, and where sulphide ores are fresh; moreover it is a sort of oxidation which is only produced by the downward effect of surface water, and is not, could not be produced by any explosive eruption of a volcanic neck, because such eruptions do not oxidize veins.

Q. Could it be produced by the downward circulation of meteoric waters.

A. Yes, and it evidently is conclusive that it is not.

Q. In other words it took atmospheric conditions to place it or surface waters?

A. Yes.

Q. Did you notice any such oxidation in the series *or* raises, testified to by the defendant's witnesses, raises two to seven-A?

A. No.

Q. How about Raise-A up in the McNamara stope?

A. The rock is fresh there; the rock is quite fresh there, very little oxidation, although at the top of it, as I remember, there are a few little stringers with some stain in them, because it is only a few feet away to the base of the Fraction dacite breccia; the contrast between oxidation in this outcrop, or any of the vein, or these unoxidized rocks, is closely grouped a series of veins, indicate clearly,—illustrate the difference between a rock that has been exposed to the surface, underlying the cap rock at the present time, and a rock which underlies a cap rock, which has been brought down by a fault,
561 where no conditions of oxidation have existed at any previous time.

Q. I will ask you to state Mr. Finch, whether or no, you encountered in any of the workings of the West End or McNamara Company, the terminal edge of that vein or any terminal edge, or if more than one, state them?

A. In the McNamara the same terminal edge is shown north and northwesterly beyond the north side line of the West End claim, well exposed at a point shown upon the model, and exposed at other points along the summit of the stope at the extreme northwest corner, and on the map, where the stope has been carried up to an outcrop against the Fraction dacite breccia, and still over to the west, along workings I have been accustomed to call the Ohio workings.

Q. That is in the California claim?

A. That may be.

Mr. Lindley: Is that right?

Mr. Dickson: That is right.

Mr. Lindley: It belonged to the Ohio Tonopah before it was owned by the West End; it is the same thing, it was formerly owned by the Ohio company. It is the California claim?

A. A long cross cut is driven westward from those workings, which follows pretty close to the contact, a cross cut driven back and disclosing it, and it is shown in a great number of points in that region.

Q. Is there any other exposures of fracture in the vein in the West End ground, that corresponds to your idea of a terminal edge except this exposure?

A. There is no terminal edge except the one that I have described and exposed at any other point in the West End.
562 There are slight dislocations which are not terminal edges, because the vein passes, and can be traced through and past them without interruption.

Q. Well, if we accept for the time being and for the purpose of this investigation or your examination, that the apex of the vein is the terminal edge, from which there is an extension downward,—is there anything shown in the West End mine, which will correspond

to that suggestion of terminal edge with downward extension? If so, will you please explain to the court and counsel what it is?

A. A very oxidized outcrop, buried by the Fraction dacite breccia, is but a terminal edge. It is exposed first, at a point across the north sideline of the West End claim, at a distance of about 175 feet, measured from the northwest corner of the claim, along the north sideline of it; it is developed at a point very near the line, so that this distance which I measured is reasonably accurate. It is shown near the south sideline of the West End claim, developed in the west end of the 500 level, and so near the line that it is reasonably accurate to state that it crossed the sideline a distance of 200 feet, from the southwest corner, measured along the sideline; that is as to the direction.

Q. Go on with your explanation there with reference to continuing those two factors of terminal edges and downward course, and explain the situation as you understand it, upon *to* your model "Plaintiff's exhibit-4" with reference to the direction of the sidelines of the West End claim.

A. The buried outcrop across the lines at the points just described and as shown upon model "Exhibit No. 4" the glass model, and from the development underground, has a curving direction
563 across the claim; it dips from the point where it enters the from the development underlying, has a curving direction because the West End claim at this point is located on the slope of the anticlinal roll, and the direction of the dip is the direction approximately which I am putting upon the block model now.

Mr. Dickson:

Q. Give us the course in degrees and direction.

Mr. Lindley:

Q. As it may have several lines of dip I suggest that you mark them A, B, C, and so forth. Proceed Mr. Finch.

A. The direction of that dip line just placed upon the model being a local dip line, starting from that arbitrary point where it passes the sideline, is about north ten degrees west.

Mr. Alling:

Q. How is that line marked upon the model?

Mr. Lindley: Marked with an arrow and a letter "A."

A. The arrow is pointing to the letter "A" on the model. It is about north ten degrees west; it would be southeast in the direction of the dip; well, it will be seen upon the black model "Exhibit-4" that it lies within the vein, this line which I have drawn and will continue to lie within the vein across the West End claim, and on beyond that point; it makes an average of some thirty degrees of an angle within the vein as measured between the line of outcrop and the line of dip downward on the slope of the vein.

Q. That is the local dip, at that point?

A. Yes.

Q. Now take the vein as a whole and give us your determination as to the dip there with reference to the side-end-line claim?

A. The direction of the dip—the real dip of the vein?

Q. Well, I am not speaking now of the mathematical dip.

564 I am speaking of the downward course with reference to the plane of the sideline.

A. It has a downward course with reference to the plane of the sideline, which can be indicated as starting at the same point, and its downward course will be followed by the north sideline of the West End claim, which we can convert into an arrow,—the dip being similar in degree.

Q. In other words leaving out the technical relationship of strike and dip, and speaking of the conditions shown in the ground, with reference to the plane of the sideline, is there a downward course from all points that the plane of that sideline cuts the vein, and if so, in what direction is the downward course?

565 A. It is a downward course, slightly flatter than the local dip marked "A," but nevertheless a downward course which would not be less than,—a dip in degrees which on this downward course would not be less than 20 degrees, I should estimate it. I will mark that, if I may, "Side line Dip" to distinguish it, as in the other case, from the real average dip of the vein.

Q. Mathematical dip?

A. Yes.

Q. Taking the vein as a whole as it passes through the West End ground on its strike across the end line,—the course of the apex across the end-line, what would you say was the course of that apex?

A. As it passes through all this territory?

Q. No, I am speaking now of the West End only?

A. The average of it, of course, if a straight line drawn between the two points where it crosses the north side-line and the south side-line of the claim. And, so far as I can get it, with the appliances for the purpose now at hand,—I will have a straight-edge, if I may, that will reach clear across—the direction is about North, 5 degrees East, and that is a course or direction of the outcrop, and not a strike.

Q. The strike is, of course, on a level?

A. Yes.

Q. And I should judge from your model, therefore, that it is ascending up a hill-side?

A. Yes.

Q. Had rather a plunging course from the summit down?

A. Yes, as is very well shown on Exhibit 4.

566 Mr. Dickson:

Q. North, 5 degrees, east, was that?

A. Yes.

Mr. Lindley:

Q. Well, I understood you to say, however, that there was no other terminal edge of any kind, side, top or bottom?

A. No, not in the West End claim.

Q. So then, this exposure which you say was the buried outcrop?

A. That is the only one where the vein ends and in this development does not continue onward through unknown distances outward from the West End claim.

Q. Taking the vein as a whole, as developed in the workings of these companies, I wish you would explain to the Court the relationship of strike and dip, and the situation generally, with reference to the vein as a whole.

A. In discussing mathematical terms, such as strike and dip really are, it is some times difficult for those who have not had considerable practice in mathematical forms, geometrical forms, to comprehend the line of dip or of strike of a curving or irregular ore body. For that reason I should be very glad if I might be permitted to show in a graphic way what the strike and dip mean, as applied to a vein, straight and an irregular one.

Q. You may do that, Mr. Finch.

A. One of the essential elements in the definition of strike, and, therefore, of dip also, is the determination of a level plane. It is a well known fact that a surface of water is the best level that nature affords. If the surface of the water, which I show in the pan, which will be a little difficult to mark as an exhibit,——

567 Q. I suppose if you have any other kind of liquor, which they have in Tonopah in there, you will have the same difficulty.

A. If we insert in this water a sheet, plain sheet, such as I hold in my hand, the line along which that sheet meets the water is the strike of it, if it were a vein. It will be observed if I do not change the inclination of it that I can move that sheet around in the water, and that line does not change. Consequently, the conclusion begins to arise at once that if this straight vein is not a straight vein, but a curved vein, the strike in that level plane would be a curved line. If we place in the water a curved surface, such as this, which may illustrate graphically in a more or less geometric form the incline or roll of the vein under discussion, we will see if we insert that sheet steeply into the water that we will have a certain line developed which I shall proceed to mark, as nearly as I can, along the surface of the water.

It will be noticed that that line is a curved line, but that it is identical in its curve with the curve of the surface.

If, however, we insert this,—have to have a little more water,—if we insert the sheet of metal at an inclination, comparatively steep inclination, there will be another curve formed, which as you look down upon the water, is more of a curve than the one which was drawn before and does not conform with the curvature of the sheet of metal. I will mark this curve No. 2 and the other one No. 1.

568 Now, we will find if we insert this metal,—if we insert the curved sheet of metal again in the water and make it lie flatly in it, that we produce a curve which is quite strikingly different from the curves formerly drawn, being a curve with a somewhat sharp point. Now, that is more like the curve that we actually find in the strike of the West End-MacNamara vein, coming to quite a

sharp point. Nevertheless, as the vein exists in the ground except for some of the top hanging-wall streaks, it is not a sharp curve. Some of the sections which show the foot-wall part of it show that the curve of this vein, of its dome, is even flatter than the sheet of metal which I hold in my hand, and yet the general strike of it which connects all around in a level surface, such as a level surface of the water, brings out a comparatively sharp point of what might be called the toe of the anticline on any particular level.

Now, just to illustrate the matter of strike a little bit fur*h*ter, the only case in which this anticline would not have a strike which runs in a northerly and southerly direction would be when it lies absolutely horizontal.

Mr. Dickson:

Q. Would be what?

A. When it lies absolutely horizontal. In that event, there would be the appearance on any level which might be driven on the two limbs, or slopes, of the anticline, there would be two parallel lines as are now shown as it is immersed again in the water. The strike of it would then appear to be east and west. As a matter of fact, for all practical purposes, it would not have any strike at all because, as a whole, on an undulating surface it would be a horizontal
569 body.

Now, the dip of a vein, such as is illustrated by the sheet of metal, is parallel with its edges, if it is symmetrical, and if it is symmetrically curved and the top of it is directly down the ridge or summit of the curved sheet. That is, the average dip, that is the dip anywhere, the true dip of the sheet as a whole. The average strike of this sheet of metal, take the last line I have drawn where it comes to quite a point, the average strike is a line connecting the two points of beginning at that horizontal water surface when the sheet was immersed in the water. That is the average strike.

Now, applying that to this vein, the sheet of metal, if the foot-wall were represented instead of the hanging-wall, the sheet of metal would have about the curvature of the West End-MacNamara vein. Its dip, as a whole, within the limits of this model is downward along the crest of the ridge. Its average strike is the strike which any horizontal line would show.

For instance, if you moved up the model about 3 inches,—about 2 inches, you come to the region of the 400-level, in which level is developed a curve about as I now trace with my pencil around the vein, and it corresponds approximately with the,——

Mr. Dickson:

Q. Now, what do we understand you to be the average strike there?

A. The average strike there on this model would be between the two points where a level run would pass around this surface as a contour.

Mr. Lindley:

Q. And the general direction of that would be what?

570 A. The general direction would be northerly, or somewhat northeasterly, in a direction across the West End claim.

Q. Now then, to determine the average strike of a vein, you would connect the two exterior points?

A. Yes. It could be illustrated on this plan map. If that map were extended a little further,——

Mr. Dickson:

Q. In what direction?

A. In a northerly and northwesterly direction, it would take in workings of the MacNamara over to a point which would be due north of the West End, of the 500-level. And a line drawn along the vein around the end, or around the sharp curve or prow at the summit of the incline would be turned into such a position in the MacNamara workings that the strike of the vein, averaged, would be almost due north.

Mr. Lindley:

Q. That situation is practically exhibited on cross-section "C," I think, of the Defendant's Exhibits?

A. Yes.

Q. A cross-section showing the 400-level which extends,—I mean the horizontal section or plan map of the 400-level of the Plaintiff's exhibit; call that section "D."

A. Yes, that section exhibits it in this way: If you take a vertical slice down through a ridge, symmetrical ridge or a hill, and any cross-section which shows that the two slopes are equal from the summit, and there is a plunge of the slope, then a line drawn as a contour around that hill, meeting at equal distance from the summit will give the strike; and the average strike will be a point connecting the two ends and will be in the line of the section; and in this instance, it would be north and south.

571 I am placing, if you will permit me, Judge, upon Exhibit No. 4, the block-model, another line drawn as well as I can in a free-hand way, showing the average dip of the body as a whole represented in the model, and will mark that "C."

Mr. Lindley: Possibly there may be some few questions I may want to ask, but otherwise, for the present, I turn the witness over to you for cross-examination. If anything occurs to me, I will have the privilege of asking?

Mr. Dickson: Certainly. Well, I do not wish to proceed with the cross-examination, until the direct is closed.

Mr. Lindley: Well, we close it.

The Court: Are you going to continue quitting time at half past four?

Mr. Dickson: I suppose so.

The Court: Well, we might as well stop, then.

Mr. Lindley: If I have some more questions in the morning we might as well close. I do not think I have anything further. If I do, I will ask them in the morning.

The Court: This case is continued until tomorrow morning at 10 o'clock.

572 13.

Seventh Day.

TUESDAY, December 15th, 1914.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley: I would like to state to the court and counsel that there were one or two matters that had been omitted from our model, that has been added during the recess.

Direct examination of JOHN W. FINCH resumed.

Mr. Lindley:

Q. Will you point them out Mr. Finch?

A. There has a stope been added which shows in a slightly brighter red in the model No. 9-A, being the MacNamara stope lying between the MacNamara 200 and 300.

Q. That stope has been prepared but omitted to be put on?

A. Yes.

Q. Overlooked it?

A. Yes.

Mr. Lindley: That same stope is on the other model?

A. Yes.

Cross-examination.

Mr. Dickson:

Q. What kind of a vein is this, Mr. Finch? How would you classify it?

A. Contact fissure vein.

Q. What is your opinion of the process agencies by which vein-, metallic veins are formed, and their ores deposited?

573 A. There are several steps in the process. The first requisite is some avenue of circulation in the rocks? That may be caused by fissuring, may exist sometimes on a contact without any dynamic force to cause a fissure, or it may be both. Then the openings through the rocks having been created in more or less sheet-like form through the rocks.

Q. More or less what?

A. More or less sheet-like or tabular forms through the rocks. The next step is the circulation of the solutions carrying the material which goes to make up the veins, non-metallic materials, such as quartz and metallic materials such as pyrite and the commercial ore minerals. Those are deposited in the opening in the rocks.

Q. In your opinion, I do not mean speaking universally but speaking generall- is it your opinion that circulating solutions from which the minerals have been deposited in veins comes from some deep seated source of ascending solutions?

A. I think that the solutions in this instnace, in this place formed this flat contact vein——

Q. How is that?

A. I think that the solutions which formed this flat contact vein were ascending solutions, at least in the sense as distinguished——

Q. I am not speaking of the earliest mineralization in the way of silicification.

A. I do not think that there is any difference in the process which caused the silicification and replacement of the rock, and the process which deposited the commercial minerals.

Q. In your opinion was there silifici-ation of the rock carried on to some extent here before the metals were deposited in the form of ore bodies, as we have them today?

A. Before, or after, or at the same time.

574 Q. You have no opinion about it one way or the other?

A. It might have been both before and after.

Q. Do you not think that there was sili-fication of the rocks, enclosing rocks of this vein that preceeded the deposition of the ore and metals, gold and silver and whatever else there may be in there?

A. There are parts along the vein of a replacement of this wall rock by silica, which is older than some of the streaks or bodies of commercial mineral. But it is not certain that that process of silicification ended before the other minerals were started.

Q. It may not have been completed before?

A. No.

Q. But it was commenced before?

A. It is coincident process.

Q. What?

A. It was a coincident process in my mind.

Q. Do you not have north and south nearly vertical fissures lying between what we call the two veins at the crest and for some distance below the crest, with a north and south strike, sometimes practically a vertical, sometimes a dip to the east, sometimes a slight dip to the west, in that intervening country?

A. We do, but,——

Q. And do you not find those——

Mr. Lindley: One moment Judge, he was starting to answer that question. He said "We do, but"——

A. But if your question involves any connection with preceeding questions, that these fissures had any connection or causal relation with the deposition of the ore, I shall have to make an explanation of what they really are.

Mr. Dickson: Go ahead and make your explanation.

575 A. Along the summit of the anticline, and at other points where the Siebert Fault plane comes down and impinges upon the vein, there are certain cracks formed. And there are cracks formed just precisely as would be expected from the over riding mass of rock which moved northeastward over this vein, they run transversly. They are seams or wounds made

in the vein by the over riding dragging rocks, they are transverse clear across in the direction of that movement. Now I say that they have no relation to the genesis of the ore because we find in those seams fragments of the Midway andesite which have dropped down into the quartz of the vein. They were therefore, formed after the Midway andesite. Places of that kind can be found, as for instance, in the vicinity of M-43.

Mr. Lindley: On Plaintiff's Exhibit 1?

A. On Plaintiff's Exhibit No. 1 on the MacNamara 200 level, where the fracture is at some distance from the Siebert fault, and underlying a natural contact of the Midway andesite, not brought down by the fault but resting there in the relation which it had when it was deposited by the volcano which produced it.

Mr. Dickson: I think that was a very much longer answer than was needed, either by the question or the explanation.

A. The answer was made entirely to explain that it has no relation to the process of deposition.

Q. I will endeavor to be patient with you Mr. Finch, and give you time to answer, but when you have gotten through I wish you would give me time to ask a question.

A. Yes, sir.

Q. Of course the Siebert fault was post mineral, as I understand you?

A. Yes, sir.

Q. And the entire mineralization has been completed,——

576 A. In this vein.

Q. Before the Siebert fault was open?

A. Yes sir.

Q. So it goes without saying that the Siebert fault has nothing to do with the mineralization at all?

A. That is true.

Q. Now, these north and south seams filled with silica found in the intervening rock between what we call the two veins at the crest, and for some distance below the crest of what you call the anticline, you do find north and south fractures?

A. They are fractures, but they are not filled with silica.

Q. Some of them are?

A. They are across the silica.

Q. Some of them are, are they not?

A. Only in certain places an older series of north and south veins are formed, and some remnants or traces of them can be seen. The north and south fractures, of which there are a great many down along the crest along the Siebert fault, those are of a different nature and are later than the quartz. No ore deposition in them.

577 Q. Are there some of these north and south seams, or fissures which are filled with silica, lying in this intervening country to which I have referred, that was there before the deposition of the matter which gives value to this vein,—or don't you know?

A. I know that there are older fissures down in the 500 level.

Q. I am confining your attention to the intervening country, immediately at the juncture of what we call the two veins, and which you call the dip of the fold, and for a distance of thirty, forty or fifty feet, below that crest; that is the place I am directing your attention to. Do you mean to say, that there are not observable in that country north and south fissures filled with silica, some of them forming practically vertical, some with a slight dip to the east, and some with a dip to the west, which were formed and silicified, in your judgment, prior to the deposition of the vein matter, which gave commercial value to this vein?

A. Yes, there are some fissures, but they do not effect in any way the form of the anticlinal vein as I have described it.

Q. I am not attacking your anticlinal fold,—just simply the facts. Give me the facts as observed by you, and your deductions from them; I want to get at any additional facts if there be any. I am not asking you to change your deductions or your conclusions at all. To what extent, to what degree is the vein here in controversy, the one vein as you term it, or the two main veins, as contended by the defendant, a fissure vein or fissure veins?

A. It is a fissure vein of a certain type, directed by a preexisting contact, as to its position.

Q. Wholly?

A. Directed wholly, yes, but not——

578 Q. Wait a minute. Does it follow the contact throughout, or do you have a fissure which in places departs from the contact, and cut- through a homogeneous rock?

A. Yes, but in doing so it is still directed by the contact.

Q. That may have influenced its course?

A. Directs its course.

Q. Of course, if you had a fissure cutting through in places, a homogeneous rock, and on its course or strike or dip, it approached closely to a plane of contact between different rocks, and that plane formed a greater line of weakness, it would have gone through the homogeneous rock,—it would be natural to expect that the fissure might break from the homogeneous rock, and follow for the greater or less distance the plane of contact,—wouldn't it?

A. I think that it is more rational to consider it as a,——

Q. A little louder please.

A. I think that it is more logical to conceive it as a process of fissuring along a contact, than broken through a crack or crevice to the contact.

Q. Would it be more rational, do you suppose, in your opinion, if the fissure opened or started in its opening along a plane of contact, that it would be likely to leave that plane of weakness and make out into a harder and homogeneous rock, than to suppose that the fissure being opened, started, in homogeneous rock, and on its course longitudinal or downward, where it approached closely a plane of contact, that it would depart from the homogeneous rock and follow for a greater or less distance this line of weakness found at the plane of contact?

A. That would be all right as a hypothetical case.

579 Q. Which would be the more reasonable to accept?

A. It would be more reasonable to expect that the line of weakness, which is the contact is the directive influence causing the form of the vein.

Q. To some extent?

A. And in this case we know that the great majority of points and by far the greater area of *of* this vein, *it* is found on a contact, and even in the area of the map, about fifty per cent of it is a contact vein.

Q. In your opinion would the plane of contact in which this vein in particular is found, or along which it is in part found, would be a greater line,—a line of greater weakness rather, than where you find the fissure cutting through the homogeneous rock, apart from the plane of contact?

A. Yes.

Q. Then if it was open along a plane of contact, and departed from that weaker line, that line of lesser resistance, cutting through the homogeneous rock, there must have been something to deflect it in that course, give it a course away from the line of greater weakness to a line of greater resistance must there not?

A. Yes, and there is a reason for that.

Q. Well, would we have to hunt for any reason for this phenomenon—we have a fissure we will say in a generally easterly and westerly course, cutting through a homogeneous rock for a portion or portions of its distance, and in its course longitudinal or course downward, it approaches closely a plane of contact, and there departs from the homogeneous rock and follows the plane of contact which was the greater weakness. Would not that be altogether reasonable to anticipate that it would have such a course,—that it would diverge from the homogeneous rock it had been cutting and at places follow the contact which was the plane of weakness?

580 A. It does not appear reasonable to me.

Q. Then it would not be reasonable?

A. Not under the conditions that we have here.

Q. Generally speaking, where you have a fissure cutting through homogeneous rock, and at places departing from the homogeneous rock following the plane of contact between two different rocks, would not the explanation that would occur to the geologist be, that it departed from the homogeneous rock and followed along the plane of contact, because having approached near that plane there was encountered a greater line of weakness than was afforded by the homogeneous rocks?

A. That is a question involving hypothetical elements, that I think, Judge Dickson, I could save time if I tried to explain the effect of the elements in the question. Otherwise I shall have to briefly state that under the conditions that we have here it is not a rational conception.

Q. Under the peculiar conditions that we have here it would be from the standpoint of the geologist rational to expect that the fissure was open first along the plane of contact which it followed for some distance, and then departed from the plane of weakness afforded by

the contact, and cut away from that into a homogeneous rock,—than the converse?

A. Cut across a bulging projection of homogeneous rock.

Q. How thick is the homogeneous rock underlying this ledge,—the trachyte as you call it?

A. It is a saucer shaped body, under the vein that comes to nothing in every direction, and at its greatest thickness might possibly be two hundred feet or so.

Q. Is the fissure cut through that?

A. Cuts across it, sliced it off.

581 Q. Leaves the contact?

A. It is on the contact all around that little knob which has been cut off.

Q. What do you call the contact?

A. What do I call the contact?

Q. Yes, what is it, trachyte, or what?

A. It is trachyte at all points on the top of the vein, but under the vein there is a variety of rock.

Q. I call your attention to Defendant's Exhibit-G and section D, thereon, and ask you what the rock underlying the vein is, displayed upon that section?

A. As displayed upon that section it is trachyte.

Q. Well, do you know where that plane of section has passed through?

A. Yes, I have a section almost identical.

Q. Well, now in that vicinity where that plane of section has passed, that underlying rock, that is to say the rock underlying the vein, is trachyte?

A. Yes, for a part of it.

Q. From top to bottom of what is shown on that section?

A. Trachyte under the vein, where the purple color is shown.

Q. From top to bottom on what is shown on this section-D?

A. From the summit of the anticline?

Q. Yes.

A. Southward in the Jim Butler that is true; for a short distance in the MacNamara.

Q. What is the overlying rock, that is to say, the rock immediately overlying the main south dipping vein?

A. Trachyte.

Q. From top to bottom of what is shown on that south dipping vein on that section?

A. Yes, that is true as of all other points.

Q. Is it true that there is a fissure vein coming through that trachyte and along which the ore bodies have been formed?

A. Yes.

582 Q. What *us* the course of that body, longitudinal?

A. Do you want to *local* direction of it in that vicinity?

Q. I don't want to just confine you to a mathematical term, one hundred feet or so from the plane of section.

A. The course of it is shown upon this map marked "Finch-5"

that is the south branch; they do not show the vein on your plan map.

Q. My question is, in this trachyte, which according to your testimony underlies and overlies the south dipping vein, there is a fissure in and along your ores, and mineralized vein deposited, and you say yes. Now, my next question was, what is the course or strike of that fissure that is thus cutting through your homogeneous rock?

583 A. General strike is in a northerly direction. Its local strike at that point is northeasterly.

Q. Can you give us more definitely than that? Northeasterly—do you mean due northeast?

A. Just about. I can give you local strikes all the way from north or south to east and west.

Q. You may do that in redirect if you wish. I do not think it is necessary as an explanation to the question. I would like to have your answer to the question I am asking. I will take you now to section A on the Defendant's Exhibit G, and ask you what is the rock which overlies the north dipping as well as the main south dipping vein?

A. They are not the same rocks. Oh, overlying?

Q. Yes.

A. Overlying the entire vein?

Q. Yes.

Q. Over the continuous vein, as we call it, it is trachyte.

Q. And underlying the north dipping vein and the main south dipping vein, what is the rock?

A. Another formation.

Q. What is it, I say?

A. The glassy trachyte.

Q. Is there a fissure found there extending from the top of the south dipping vein, as represented in red on Section A to the bottom of it, as represented in red, in and along which the ores have been deposited and from which mineralization has extended?

A. Yes; more mineralization extending into the hanging wall than is shown on that section.

Q. What is that?

584 A. There is more mineralization extending into the hanging wall than is shown on that section.

Q. Calling your attention to the fraction vein, so called, as shown upon this section A, what is the country rock overlying and underlying that vein?

A. That is a vein entirely in the lode porphyry, as most of the veins of the district.

Q. The same rocks above as below?

A. Yes sir.

Q. And have you there a fissure?

A. Yes.

Q. Extending from the top of the Fraction vein, as represented upon this section, to its junction with the main south dipping vein, in and along which the ores, minerals, have been deposited?

A. To its junction or intersection.

Q. What?

A. To its junction or crossing whichever it may be, that is true.

Q. I am going back again—this section A, as you understand it, is near the easterly end line of the West End claim?

A. Yes sir.

Q. And section D where we also have the fissure which you have described as near the westerly termination of the ore or the vein in its course westerly?

A. Yes sir.

Q. And there you have represented on Section D, also, what has been spoken of by the witnesses for the Defendant as the south
585 branch of the south vein. That in its upward course encounters cap rock, does it not?

A. In its upward course toward the west, yes.

Q. And when you get some distance below the top of that south branch of the south dipping vein, from thence on in its downward course is formed a junction of the south dipping vein, the hanging wall and the foot wall of that portion of the vein is the same character of rock?

A. It is, or it was at one time.

Q. What?

A. I say it is or it was at one time; some of it has been eroded away.

Q. So far as you are able to observe, it is now?

A. No, there is some Fraction dacite breccia resting upon the hanging wall of it.

Q. But the figure there—that portion of the south branch of the south dipping vein to which I have called your attention follows a fissure, speaking generally, follows downward, and we have the same character of rock overlying and underlying it, speaking generally?

A. That is true, yes.

Q. And apart from some intrusions, as I understand you, of the Fraction dacite breccia?

A. There is no intrusion.

Q. Well, we will change the question: apart from the place where you find some of the Fraction dacite breccia, that vein has the same rock for its hanging as for its foot wall?

A. Yes. In other words, there it is not a contact vein.

Q. Yes, of course, that goes without saying. What is the course of the fissure as disclosed and followed in the territory
586 through which Section A on Defendant's exhibit G has passed, from the top of the main south dipping vein to its bottom? Its longitudinal course in that locality?

Mr. Lindley: That is considering that as an individual, separate vein?

Mr. Dickson: Of course. I am not trying to commit the witness to anything that is in conflict with the conclusions he has reached.

A. You mean by that its strike and dip down through the ground?

Q. Longitudinal course, I mean.

A. That might be its dip.
Q. Well, its longitudinal course through the country would not e its dip, would it?
A. We speak of the longitudinal projection of the vein as the topeing map lengthwise of the vein it follows. It may be dip or trike, or midway between both.
Q. I am not speaking of any projection. In the country in the icinity of the place through which this Section A was passed or aken, what is the course or strike of the fissure which you say the res in the main south dipping vein lie in or follow along from top o bottom?
A. It starts in in the Jim Butler region.
Q. No, in this region.
A. Yes, in this region. In this section. It starts in south of the est end territory, in the Curtis claim and runs in a northeasterly irection. Then it turns to a northerly direction; then it turns to a orthwesterly direction.
Q. Do you think these fissures that we have been calling
587 your attention to on these two planes of section afforded a channel for the circulation of the ascending solutions which arried the metals and minerals in the solution and deposited them in nd along this fissure?
A. Meaning by this fissure the entire deposit?
Q. I am speaking now where the country is cut by the plane of ection A, or where that plane is passed through?
A. It did afford a channel of circulation at all times during the rocess of the formation of the vein.
Q. And that is true of the fissure you have referred to as being ound in the country where Section D is passed through? That as a channel of circulation for these solutions?
A. At all times, from end to end of that section.
Q. Will you point out on Plaintiff's exhibit 2 where Section A of Defendant's exhibit G was passed or taken?
A. I will have to look at your plan map. No, I can determine hat another way. It is east of the east end line.
Q. About how far?
A. Passes very near the northeast corner of the claim and a little urther away from the southeast corner.
Q. Now, in that same connection, tell us where Section B on Defendant's exhibit G was passed?
A. Section B?
Q. Point it out on the model.
A. That is just inside of the east end of the West End claim. It passes very near the northeast corner and about——
588 Q. About 30 feet west of the southeast corner would be near enough?
A. That is about it, yes.
Q. Now, will you show me where Section C on Defendant's Exhibit G was taken? About how far west of the east end line of the West End claim?
A. Section C passes near a corner where the angle occurs in the

north side line. Passes near the angle in the north side line, and about 270 feet southwesterly from the southeast corner, measured along the south side line.

Q. Now, what is the distance from—in the southerly portion, that is near the south side line of the West End claim, I do not care for just the exact point—how far easterly of Section C is Section A?

A. About 320 feet, measured along the direction of the south side line.

Q. 300 what?

A. 320.

Q. Now, along in the country where each of these three sections, A, B, and C were taken, I suppose you have a fissure in and along which the ore bodies and mineralization is found?

A. Please read that question.

Q. (The reporter read the question.)

A. Yes sir.

Q. Will you step to the model, Defendant's exhibit A, for a moment. What is the course easterly and westerly of the stopes shown upon this model from their easterly terminus before we come to any break in the ore, in the stopes, to the point where we come to the first break in the westerly end of the stopes?

A. That is just about east and west.

589 Q. Just about east and west?

A. As a local strike.

Q. And the three sections, A, B, and C, have been passed through that country?

A. Yes.

Q. And the ore which each section is taken is found to be lying in and making from the mineralization, making out from these fissures, that you have spoken of?

A. I have only spoken of one.

Q. You said there was one fissure found in Section A, along which, from the top to the bottom of what we call the south dipping vein, the ores were found; also in Section B, and also in Section C, have you not?

A. The stopes to which you are pointing are upon one vein, and the same vein is shown in the three sections.

Q. At all events, where Section A is taken, from the top to the bottom of what is represented on that section as the south dipping vein, you are following down on a fissure in and along which the ores and mineralization is found? That is true, isn't it?

A. Yes, if you do follow it down.

Q. Well, you said you followed it down?

A. You can follow down, or you can follow up; in any event you would be in the same fissure.

Q. I do not care whether you are following down or up, that makes no difference. And where Section B was taken, on Defendant's exhibit G, you followed down, or follow up on a fissure from top to bottom of what is shown upon Section B as the south dipping vein, and in and along that fissure you find the ore and the

590 mineralization, do you not?

A. Yes; except there is one thing to qualify in your question.
Q. What is that?
A. You can follow up to a certain point where you can no longer follow up, but you have to pass over and follow down again.
Q. You have a fissure all the way, and you have ore all the way?
A. Yes.
Q. The fissure, I suppose has been faulted in places?
A. Yes.
Q. Just as the ore in the stopes, those ore bodies have been faulted?
A. Slight displacements.
Q. But apart from that displacement, you do follow continuously where each of these three planes of the section is taken, a fissure from top to bottom of what we claim to be the south dipping vein, and in and along that fissure, where cut by each of these three planes you find the ore deposit?
A. There is no question of the continuity of the vein for that area which you have described.
Q. Just answer the question.
A. You can follow it along through all those workings continuously upon the vein.
Q. What is the distance to where you have the stopes taken, as you have said generally, easterly and westerly course, from the easterly end of the stope east of the east end line of the West End claim, thence westerly to where you come to the first interruption in the actual stope? Give me the distance from here to here (indicating on model)?
591
A. Scaling from the point where the stope ends in 501 drift, as shown upon this model——
Q. That is it.
A. That will have to be done rather roughly on the model.
Q. Well, do not minimize or unduly exaggerate.
A. About 550 feet. That is measured horizontally.
Q. And throughout that distance the——
A. And easterly over in the Tonopah Mining Company at the end of the stope.
Q. There, we have the course of the stopes at that level traversing the country easterly and westerly?
A. That is true, yes sir.
Q. Now, come to the west end of the stoping, as shown upon Defendant's exhibit A, I call your attention to the westerly terminus of the stope, as here shown, just about raise 582, to the easterly termination of the stoping, that is we come to the first break in the stoping in which is found the bottom of workings marked 570; what is the course of the stope there, easterly and westerly?
A. North easterly.
Q. About how far from easterly and westerly? What are the two courses?
A. About north 65 east. That is the general way. It is a local strike.
Q. That may be. I will take you now to the stoping that is

found without interruption, as represented on Defendant's exhibit A from its westerly terminus just beyond—what is that figure, 308?

592 A. 309.

Q. 309?

A. Yes.

Q. Give me the distance from that westerly stoping there shown in red to where we come to the first easterly break in continuous stoping, first easterly interruption? What is that distance?

A. About 480 feet.

Q. And what is the course of that stoping from end to end, average course?

A. At the westerly end—well, the average would be a little more to the north east than the stoping below.

Q. Practically the same? Substantially the same?

A. At the westerly end of it it is just about due north east.

Q. And you follow there in that section of the country from the top of what we claim to be the south dipping vein to the bottom of the stoping shown up or down the fissure in and along which the ore and mineralization is found to occur?

A. That is a continuous, uninterrupted vein from the point where the red meets the yellow.

Q. That is not my question, whether it is a vein or not. My question is, if you do not follow there without interruption, excepting due to the faults, where the ore passed—follow the fissure—if you do not follow through that section of the country continuously from the top to the bottom, or from the bottom to the top a fissure in and along which the ore and other mineralization is found?

A. You do.

Q. I will take you now to what we call the north dipping

593 vein as shown upon Defendant's Exhibit A, and ask you to give me the distance from the most westerly stopeing shown on Defendant's exhibit to the most easterly stopeing, and ask you to give us that distance?

594 A. About eleven hundred feet, measured in an east and west direction, not measured along the stope.

Q. And for that distance you are unquestionably in the same ore deposit?

A. Undoubtedly.

Q. And you can follow along the stopings that I have just called your attention to, and what we call the north dipping vein, do you not have a fissure from top to bottom except where it has been interrupted, by local faulting along which the ore and mineralization is found?

A. That is true, yes sir.

Q. I call your attention to what I will call an annex to the model, Defendant's Exhibit-A, to a stope in which is found the letters "T. Co."—meaning for the Tonopah Company,—that red stope; in your judgment is that a portion of the same vein, or the same ore deposits that we find at the easterly terminus of the next ore body in red, west of "T. Co."?

A. I am not sure.

Q. Have you any opinion about it? Can you correlate it?

A. I am not sure whether it is that ore body or a segment of the fraction vein. There is a fault already described intervening between the West End stope and the Tonopah Mining stope itself, and this stope which is shown on the extension to the model is still further to the east.

Q. So, if I understand you, so far as your observation or opinion goes, it may be or may not be a part of what we call the main south dipping vein?

A. That is true.

Q. Assuming that it is a part of the main south dipping vein, then give us the distance from the easterly terminus of the stope "T. Co." to the westerly first interruption in the stopeing?

A. Drift 501?

595 Q. Drift 501.

A. About 775 feet.

Q. And the course of that from end to end is practically east and west?

A. Well, that is on the assumption that that is the same vein.

Q. Well, of course.

A. You could hardly speak of the course of it; I should say that where it passes the fault there is a considerable displacement.

Q. What is the course of the stope shown on defendant's model Exhibit-A, in which the figures 555 are found, from its easterly to its westerly terminus?

A. That is just about due northeast the direction in the horizontal plane.

Q. Northeast or southwest?

A. Northeast and southwest, like that.

Q. What is the course of it measured from the easterly to the extreme westerly terminus of it?

A. That would be its strike.

Q. What is the course between those points?

A. Well you can take them in an east and west direction between the two points mentioned down the slope of the stopes.

Q. In other words measured in that way, it has about the same direction as all of the stopeing shown in red to the east thereof, has it not?

A. Yes, and the other directions have been given as the strike locally of the vein.

Q. What is the course—I will take it that way if you prefer or the strike of the stope, west of the West End shaft where you find the figures 403?

A. Oh about north 70 east.

Q. Between what points do you select there as determining

596 the *the* course?

A. Take the stope itself and lay a horizontal line up in it, as I am now indicating with the pointer, more northeasterly than I stated.

Q. What is the true local dip of the vein where that ore body is found?

A. Where that particular stope——

Q. Where that ore body is found, what is the true local dip of what we call the main south dipping vein?

A. The dip is steepest down that vein almost due southeast.

Q. I understand that it is now your opinion that there is not found anywhere in the West End claim, the top or apex of any vein, unless it be what was sometime in the misty past, in your opinion the outcropping area, where that ore encounters the Fraction dacite breccia?

A. In my opinion that is the only termination of the vein along the line of that buried outcrop.

Q. When did you first make an examination of the underground workings, or any of them, in this ground in controversy, with a view of acquainting yourself or preparing yourself to testify in the case as an expert?

A. I arrived here the morning of April 28th, this year.

Q. How long were you engaged in your examination at that period?

A. Twenty six days, pretty nearly a month.

Q. How long?

A. Twenty six days.

Q. When was your next visit?

A. Arrived here the 25th. of August.

Q. How long were engaged then?

A. Until the 5th. of September.

Q. When, Mr. Finch, did it first occur to you that this westerly edge which you speak of now, as being the top or apex if this vein has any top or apex,—was or might be its apex—when?

597 A. When I first saw the profound disintergration and staining and oxidation of it at the 600 level?

Q. When was that?

A. I don't believe that I could fix that date.

Q. Was it during your first visit?

A. The first time that I ever went into that level as I recall. The first time I ever saw that end of the level as I recall.

Q. Was that during your first visit that it occurred to you that this terminal edge was, or might be the top or apex of this vein?

A. I am not sure that it was the first visit.

Q. Well, what is your best recollection about it?

A. Well, I am sure that that matter became clear on my second visit.

Q. Well, you were out through that westerly terminal edge on your first visit, those twenty six days that you were here?

A. No.

Q. You did not go out there at all?

A. Not that I recall. On my next visit I didn't.

Q. You are sure that you did not?

A. No, I am not sure that I did not. There is great area to cover here and there has been a great deal of detail of taking of notes, and

I could not recall the dates in any particular working.

Q. I am not asking for the particular date, I don't suppose that you could give that unless you made a special memorandum of it. Are you unable to teil us when it occurred, I do not mean the date, but on which of your visits that you made you- examination by which you determined that this westerly edge was the top or apex of the vein?

A. I think that it was in the August visit.

Q. Did you first suggest that, or did some of your co-
598 laborers co-investigators, *made* the suggestion? You or Professor Lawson or Mr. Searls or Mr. Siebert.

A. I think that we were more or less simultaneous in arriving at it.

Q. Some one must have observed it first?

A. I think I did observe it first, but it was at a time when we were working together on the same level.

Q. Then am I to understand or is the court to understand that you were the first one to suggest that the course or strike of this vein was northerly and southerly across the sidelines of the West End claim, and that its apex is found at its westerly terminal edge where you come in contact with the Fraction dacite breccia?

A. No I would not say that I made the suggestion that the course or strike of the vein——

Q. What is it?

A. I would not say that I first made the suggestion that the course or strike of this vein was in a northeriy or southerly direction, because taking the vein as a whole I believe that opinion has existed in Tonopah for a long time.

Mr. Dickson: I will ask that that be stricken out. The opinion of the witness is all that I want, not the opinion of Tonopah.

A. Well, I said that I would not take the credit for originating that idea.

Q. Who made, if you know, who first suggested that this westerly terminal edge was or might be the top or apex of the vein?

A. I think I did make the suggestion, or show the condition of a buried outcrop, first.

Q. Were you the first to make that suggestion that that
599 might be taken to be the top or apex of the vein?

A. I possibly made the first observation.

Q. Possibly. Is that your best recollection?

A. Yes, certainly.

Mr. Lindley: I submit that the witness ought to be permitted to finish his answer before counsel interrupts.

Mr. Dickson: I thought that he had answered. Just read the question and take his answer.

Mr. Peck: The motion of Judge Dickson to strike out, I don't know whether it was ruled upon, and Judge Dickson probably did not hear.

The Court: It was not ruled upon, because I did not think he was

insisting upon any ruling to the explanation Mr. Finch made. It can be ruled upon. Do you want it ruled upon.

Mr. Dickson: If I was trying the case before a jury, yes, but before the court, no. I think that the court will discriminate between his opinion and the general opinion.

The Court: The opinion in Tonopah generally will be disregarded.

(Question and answer read.)

A. It is my best recollection that I made the first observation that that was a buried outcrop; that is among the engineers connected with the case.

Q. Do you remember to whom you made the suggestion, first?

A. Mr. Siebert and Mr. Searls, I think.

Q. So far as you are able to recall nobody had suggested that to you, before you had observed it and suggested it?

A. No, I think not.

Q. Now, can you in the light of that fact, can you recall whether or no it was during your first examination of some considerable—covering a very considerable period, that you made that observation?

600

A. No, I think that it is the second period, but I wish it to be understood that that is not a difficult thing to observe; it is merely something that was not arrived at, because we were mapping the vein in its position, and had not up to that time particularly studied its characteristics.

Q. Was not one of your purposes on that visit, and all others, to ascertain to your own satisfaction where the top or apex of this vein was?

A. During my entire first visit my time was occupied entirely with the detailed routine of mapping the position of the vein, without forming any conclusion as to its end or apex, or anything else.

Q. When did you first begin to investigate with a view to determining, if you could, where the top or apex of this vein was, if it had any?

A. After we got the map together showing where the vein existed in the ground.

Q. I cannot hear you.

A. After the notes were all correlated and put together, then the effort was made to begin to form conclusion.

Q. That is as definite an answer as you can give to the question I suppose?

A. It is true that on my visit, my first visit, I did not feel that I had given the thing enough searching scrutiny to form reliable conclusions. I did have more of a feeling that the conclusions were reliable in the August visit.

Q. Is it your opinion now that what you call the westerly terminal edge the top or apex of the vein?

A. Undoubtedly.

Q. And that is based upon the fact that you found the vein as you go westerly terminating against this Fraction dacite breccia, and found the oxidation?

601

A. Yes, and the other things which I have mentioned.

Q. What else?

A. The disintegration of it, the disintegration of the vein at that point, and the fragments of it in the form of float lying below the buried outcrop.

Q. If you found float there what does that tend to establish except that that surface had been exposed once?

A That is just what it tends to establish.

Q. Nothing else. What do you mean by disintegration along that line?

A. It showed a cracking and breaking up of the quartz and filling with material working down from the surface through the soil, as is the case in the outcrop of veins at the surface everywhere.

Q. You would expect that if that was an exposed surface and the vein was at the time on the surface and exposed—you would find some oxidation and breaking up and disintegration of the outcrops of the vein? That is what you mean by that?

A. Yes, certainly.

Q. Suppose there had been an eruption, volcanic or other eruptive rock, in the region which you now call the westerly terminal. That would have the effect of disintegration and breaking it up?

A. It would break it up, but if it was an explosion working upward, it would not leave the fragments below the outcrop, and it would only have the effect of cracking up the edge of the vein, and not have the effect of oxidizing it.

Q. Take one question at a time. If there had been an intrusion there from a very considerable area of eruptive rock, it would
602 have the effect naturally of disintegrating and breaking up the vein along the cut-off edge. We will come to the oxidation afterwards.

A. It would shatter it. If the volcano itself were conceivable that would be the cause. It would be shattered, the vein, where it crossed it.

Q. Now, coming to Plaintiff's model exhibit-2, point out to the court the various places where you find the ore of the vein terminating against the Fraction dacite breccia?

A. At all the points.

Q. Take but one at a time and point them out?

A. In winze 664 below the 600 level, in the extreme westerly end of the 600 level; at the extreme westerly end of the 500 level, where in each instance the vein stops at the Fraction breccia, which overlies the outcrop. In the 300 level where the vein is actually stoped up to its outcrop; and in the cross cut below the stope, stope marked 4; in the 172 level of the Porcupine shaft, where a raise upon the vein goes to its outcrop.

603 Q. There you find the breccia above the vein?

A. Yes, as in all cases. And in raise 166, where a raise also upon the vein shown in red, the raise cuts up along the vein, penetrating the breccia the same vein as stoped in this MacNamara region that shows a very good exposure of the outcrop and of the float connected with it.

Q. There, the outcrop or cap rock lies above the vein at those two places?

A. Oh, yes.

Q. Here it lies on its westerly terminal edge?

A. It lies above the edge of the vein in all places.

Q. The edge of the vein but-s up against it, does it not?

A. Yes, at this point.

Q. Where is that?

A. Stope 4, on the West End 300 level.

Q. And this next place?

A. That is the extreme west end of the 500 level.

Q. And the next place?

A. Extreme west end of 600.

Q. And the next place as found as you follow the ore downward, you encounter this same fraction dacite breccia?

A. That is a slightly different case. It is not the end of the vein, it is the hanging wall of the vein which was exposed to the surface, and the vein still projected on westward beyond that winze. There is another case of the same kind along the stope between the 300 and the 200, and the 300 and the 400.

Q. Number it.

A. Marked, and shown by the yellow shown upon the edge of the slope. That is a mere case where the overlying rocks have
604 been washed away in a gulch, and the breccia overlaid the vein or hanging wall of it, not the end of it.

The Court:

(Q.) Did you speak of this point (indicating)?

A. The vein shows up into the breccia here and that extends out into the overlying foot wall rock. Another point where the rock meets the breccia, not the vein.

Mr. Dickson:

(Q.) So that you have to-day in the ground many places where you find what you call this fraction dacite breccia encountered, as you go upward through the hanging wall of the vein?

A. Yes.

Q. And in this working, 650 A?

A. No, there are only three places where the hanging wall is exposed, as distinguished from the terminal edge of the vein.

Q. Well, in three places, then, and a very considerable distance easterly of what you call the outcrop of the vein you find this fraction dacite breccia overlying the hanging wall of your vein?

A. We do. Not very considerable distance.

Q. Well, several hundred feet, according to the model?

A. No, about 200 feet. And it is in a gulch which is shown.

Q. Isn't here a place? (Indicating?)

A. Yes, that is up toward the head of the gulch on the hillside. Here is another point on the gulch.

Q. What is this point I am now pointing to? How do you designate that on the model?

A. That is raise 250, it is called.
Q. On the map exhibit 1?
A. Yes.
Q. How far is that easterly of the westerly terminal edge
605 of your vein?
A. That is about 300 feet.
Q. And then in another place——
A. That is because the gulch ran at an angle way up the hillside.
Q. Nevertheless, the dacite breccia lies above the hanging wall at the vein there?
A. That is true.
Q. And then, as you go down winze 664, as you follow down that winze in ore, you come through from a downward course in contact with this same dacite breccia?
A. Yes.
Q. Then, there are three places that you have pointed to heretofore where the——
A. 5 on this side, and a number on the MacNamara side.
Q. Well, where at the westerly terminus it comes up against the dacite breccia, it has flowed out and covered it up at some period after it was an exposed and eroded surface along that terminal edge?
A. That is true, yes.
Q. What?
A. That is correct. I would like to explain that in one of these places in the upper level of the MacNamara, the outcrop is complicated by a little local fault displacement, but the fraction breccia is shown there, nevertheless, in the oxidized materials mixed up both with the contact and the fault plane.
Q. How long, speaking in time as measured by geologists, in your judgment was that which we call the outcrop or terminal edge of this vein exposed at the surface before the flow or eruption, whichever it was, of the fraction dacite breccia? Thousands of years?
606 A. Oh, yes; many thousands of years.
Q. Many thousands of years that was an exposed surface?
A. Yes; being worn away all the time, of course.
Q. What?
A. Being worn down all the time by erosion.
Q. Yes.
A. The outcrop of the vein working further down the dip toward the east.
Q. And how long has it been since the outpouring flow or eruption of the fraction dacite breccia took place? Many, many thousands of years, in your judgment, I take it?
A. How long did you say?
Q. Yes.
A. Oh, I would not undertake to estimate that.
Q. But even speaking of time as you speak of it, as a geologist, a very long time?

A. It was long enough to change the topography, which had a general slope towards the south on the Midway andesite surface, to another slope in a totally different direction.

Q. Well, ages of time?

A. Not as a geologist uses the word age, that is about the longest geological term.

Q. I do not use it as a geologist does.

A. In a human sense, ages, yes.

Q. Probably since before the commencement of recorded history?

A. Very likely.

Q. Throughout those thousands of years that must have intervened or elapsed since the Fraction dacite breccia was erupted or poured out over that country, of course, I take it neither you nor any other geologist could tell what changes have undergone in
607 that Fraction dacite breccia? It might have been, in ages past, after its outflow much more open and broken, giving access to the air and to the surface waters than would be observable to-day?

A. If that had been the case, I think we would see the marks of it in the mine, but we do not.

Q. Is it your opinion that from the time that Fraction dacite breccia was deposited through all those thousands of years since then, that there has never been an opportunity for the surface waters and the air to come down through that material and encounter what you call the outcrop edge or terminal edge of this vein?

A. I will tell you, if you care to have me, what I find in the mine bearing upon that subject. In the 300 level, cross cut running from the end of the vein in a curved direction around into the Ohio, there is a great deal of this rock. It is loose, to a certain extent, but I can not find in this level any of the evidences that a water body existed in the rock.

Q. No, I do not mean a channel.

A. No, I mean the rock was not saturated with water, and it has not been a free avenue of circulation. The rock seemed to have compacted itself into a pasty matter which is not permeable.

But that does not convince me so much that oxidation could not be effected upon this vein, as the fact that the most marked and intense alteration which is shown is at the depth of 600 feet in the mine, and that the depth of oxidation from present day processes I have not found to extend any great distance at all below the surface.

Q. Suppose ten thousand years ago, after the outflow or
608 eruption of the Fraction dacite breccia, it, that rock, that breccia had been saturated with water—I do not mean defined streams of water running through it, but percolating water in it coming down from the surface, breaking down through the rock in that form; not a form of defined channels, do you mean to say that the evidence of that condition could not have been obliterated in all the ten thousand years following, so that it would now be impossible for you to discover it?

A. Yes, I mean to say precisely that. Because water standing in the rocks is not an active means of alteration, and water in all the

mining districts of the west practically does stand in the rocks in the presence of sulphide ores and does not oxidize it beyond a certain depth.

Q. I did not mean stagnant water; I meant water percolating downward from the surface through that breccia; couldn't it have occurred ten thousand years ago, and be no trace of it left now?

A. Well, I don't think it could be a rational conception.

Q. You do not?

A. Not that water percolating through this entire area should have left its marks of oxidation along the slender line at the edge of that vein under present day influences.

609 Q. Well, the entire area, so far as you have it oxidized along the terminal edge of this vein in feet is very small? How many feet have you in exposure here at this—what do you call this point?

A. That is the west end of the 600-level.

Q. How many feet of exposure do you have there of oxidized rock?

A. Quite a number. I will tell you more exactly from my notes. It is exposed in two points there not far away from each other.

Q. How many feet each of oxidized rock?

A. Oh, the rock is thoroughly oxidized for a distance of 150 feet along the level.

Q. At this place?

A. Yes.

Q. What is the scale of this model?

A. Forty.

Q. Well, it is not more than — inch, as shown here.

A. You asked for the oxidized material. It extends back from the outcrop into the vein.

Q. Oh, it does. Above the vein?

A. No, in the vein itself. The oxidation is of the vein and of the outcrop and down from the outcrop for a certain limited distance, and it extends back for something like 150 feet eastward; however, the vein on a strike, that does not mean that it extends very far downward from the outcrop.

Q. How far upward do you go there before you get to the outcrop?

A. A hundred feet from the westerly terminus,——

610 Q. Of that level?

A. You have the actual outcrop in the end of the level.

Q. I know. How many feet have you there exposed of actual outcrop where you find the oxidation?

A. About 40 feet, all told, I should say.

Q. And then going to the 300-West End, the terminus of that——

A. Five hundred.

Q. Five hundred, is it? At the westerly terminus of that how much of an exposure of the terminal edge have you of the oxidized ore?

A. About the width of the drift shown there, as is natural when the drift follows the vein to the outcrop.

Q. Now, at the westerly terminus of stope 4, shown on this model:

to what extent have you an exposure there of the terminal edge showing oxidation?

A. Down along the,——

Q. (Int.) Right on the terminal edge.

A. Probably 30 feet, or more.

Q. And where next, as we go northerly, do you find the vein terminating against the dacite breccia and the rocks in contact therewith oxidized?

A. At the terminal edge? The next point in the 172-level.

Q. How much of an exposure there?

A. Without looking it up definitely, I should say 8 or 10 feet.

Q. More than is shown on the model here?

A. Well, it goes up slightly diagonal. It cannot be shown very accurately in detail on the model.

Q. Where next?

A. And then in the 166-level, quite an exposure of it there.

Q. That is above, in the hanging-wall country?

611 A. I should say there would be 15 feet exposed there.

Q. That is in the hanging-wall country?

A. No, that is the outcrop of the vein.

Q. You say it is the outcrop of the vein?

A. Yes. Lays right in the dacite at the workings in that level.

Q. Is the vein exposed throughout that level?

A. No.

Q. How far is it exposed?

A. About, I should say, 15 feet.

Q. Calling your attention to this point, you gave me the number of that once before and I have forgotten.

A. It is marked on the model 250-raise.

Q. 250-raise. There the dacite breccia lies in the hanging-wall country?

A. Yes, lies right on the hanging-wall of the vein.

Q. Is that oxidized too?

A. Oh, yes.

Q. And how far,—you told me it was over 300 feet from the terminal edge.

A. That was the point.

Q. Where have you found in this mine,—what depth have you found the greatest amount of oxidation, the most extensive and most intense?

A. On this particular vein, as I stated, it is at the buried outcrop on the 600-level, and extending back into the vein.

Q. Do you find the most extensive and most intense oxidation; where, in the mine, what is the greatest depth in the mine, apart from this terminal edge, so-called, where you find the most extensive and most intense oxidation?

Mr. Lindley: Away from the terminal edge.

612 Mr. Dickson: Yes, away from the terminal edge.

A. Well, that is the deepest point.

Mr. Lindley:

Q. Well, he means oxidation in the mine at some other place.

Mr. Dickson:

Q. Apart from this deepest point.

A. Well, there are a number of other points where there is oxidation.

Q. How deep down?

A. Under this Midway andisite cap rock.

Q. How deep is that where you have the oxidation?

A. 400 feet; on the east end of the 400-level there is considerable oxidation.

Q. Point out on the model about where it is.

A. It is around this whole hanging-wall stringer region in the east end of the four hundred; the Midway andesite, buried surface under the Midway andesite existing there.

Q. And down in the mine where the ore bodies are found, do you find oxidation apart from along this terminal edge?

A. I do not recollect any noticeable oxidation, except near what was at one time the surface of the earth.

Q. Were you pursuing your investigation with that particular question or fact in mind, namely, as to where you found down in the workings of the mine, way beneath the cap rock, oxidation?

Mr. Lindley: I did not understand the witness to say that he found it way beneath the mine under the cap rock.

Mr. Dickson: I did not say he did. I asked him if he had it in mind when hunting——

A. I do not have any conspicuous places in mind.

613 Q. Have you any, without being able to locate the point? Have you, apart from this terminal edge—I will keep away from that now,—have you in mind any place where you found quite extensive oxidation down in the mine below the cap rock?

A. No, I do not recollect any places, except workings up to the bottom of the Midway andesite, or the Fraction breccia.

Q. I repeat the question I put to you before,—did you, as you went through the mine, have in mind that particular thing,—where, under what circumstances, and how extensive you found oxidation, apart from this terminal edge.

A. Yes, I tried to keep that in mind, yet there are many places in the mine where other things were of such interest that I might have overlooked some little patch of oxidation.

Q. I do not mean little patch; I mean extensive oxidation.

A. I might have overlooked a considerable patch of it where it would have no particular significance.

Q. If you were to break rock—take your specimen, what is the marking on that, Mr. Finch?

A. Intended to be "Finch 8."

Q. And this one is?

A. "Finch 9."

Q. Where rock, broken rock especially, is exposed at the surface, and where you have changing conditions in the atmosphere, changing conditions of moisture and dryness from time to time, week to week, the work of oxidation will set in very rapidly, will it not? In a very short time?

A. Depends upon the material.

Q. Well, material such as these two specimens, 8 and 9?

614 A. They are very slow to oxidize because,—that is, to show the visible effects of oxidation. This staining comes from metallic minerals mostly iron, and there is very little iron in the quartz.

Q. Iron oxidizes readily when exposed to the air and changes in the moisture?

A. What I mean to say is, that if there is a considerable amount of iron stain it may develop more rapidly, but where there is so little iron it will develop very slowly.

Q. Is might not appear to be so intense, but if there was iron, at all, exposed at the surface, it would readily oxidize wouldn't it?

A. Oh, yes.

Q. And show the stain the color?

A. Yes.

Q. For instance, if you were to break rock in a mine this month, throw it out on the dump, if it contained any iron, even a little iron, and leave it there until next autumn wouldn't you expect to find the evidences of oxidation on the broken rock on the surface of the dump?

A. With some ores, that is true.

Q. Rock carrying iron in any appreciable quantity?

A. Yes, any considerable quantity that may be true.

Q. And even a little quantity, whatever it was, if it were on the surface of the rock, it would be readily oxidized wouldn't it?

A. Yes, if it was exposed to the air. But it would not be the oxidizing effect shown in these specimens.

Q. Well, I do not know anything about that.

A. There is additional material besides the oxidation.

615 Q. The oxidation here on this sample 8 shows where there has been evidently a crack in the rock, fracture?

A. Yes.

Q. The oxidation does not appear to have extended here to any great depth, on either surface?

A. No. But it is accompanied by the deposition of other minerals along with that stain, superficial deposition of minerals along the outcrop of the vein. These minerals are deposited by a very slow process, such as this crestification of silica and other minerals.

Q. How long would it take do you know?

A. Oh, I don't know; a long time.

Q. If you were to take a steel blade and throw it out on the lawn, where the dews were falling and the next day the sun shown in forty-eight hours you would have evidence of oxidation, of the steel itself wouldn't you?

A. Yes, but we do not have any native steel in the veins.

Q. Well, is steel more rapidly oxidized than the iron that is in the ore?

A. Oh, yes.

Q. Noticeably so?

A. Oh, yes.

Q. The iron itself, I understand you to admit, when exposed to the air and to the rains and the sunshine, will show evidences of oxidation in a very short time?

A. Yes. Oh, in not a very short time.

Q. Well, in a few months, as compared with a few hundred thousand years?

A. Well, in a few years, as compared with a hundred thousand, it did not take a hundred thousand years, now understand, to produce the stain in this outcrop. The stain is produced as the erosion goes along, and a certain stained outcrop is in time removed,
616 and stained outcrop takes it- place. It is not a long period of oxidation.

Q. Was the oxidation on this exposed surface, as you believe it to have been at one time, where this terminal edge is found, more rapid than the erosion?

A. Somewhat. In certain cases they may keep in step so that very little oxidation is left; the erosion keeps right up with the process of oxidation. In other cases the oxidation may work much more rapidly and the erosion be way behind it, so that the oxidation is deep in a vein.

Q. What is the nature and structure of the material that you call Fraction dacite breccia agaunst which this vein in its westerly course abuts or terminates?

A. It is a fragmental rock.

Q. What?

A. It is a fragmental rock.

Q. Broken rock do you mean?

A. Broken in the sense that it came in the form of fragments and praticles from a volcanic vent, and settled upon the earth in part. Other layers,—it is somewhat roughly bedded, other layers appear to have been somewhat in the nature of a mud flow at the time of the volcano, so it varies from a rather fine material into a rather coarse material and it includes fragments of the older rocks which aside from the position of the Fraction breccia indicate its age with reference to the included rocks.

Q. Do you know whether this Fraction dacite breccia, when it was first penetrated by the mine workings, at the westerly terminus, or elsewhere, whether it was dry, hard, rock or soft and full of water?

A. I do not know much about that.

Q. Do you say—you do not know anything about it?

617 A. No, I do not think that it would make any difference to my conclusions if I did know.

Q. About this Siebert Fault, that I understand you was post mineral? It had nothing whatever to do with the deposition of any of the ores or mineralization that we now find in its vicinity?

A. Nothing to do with them except to clip off some of the stringers that extended up into the hanging wall.

Q. Where if at all did it fault?—Another question: Have you been able to determine the maximum extent of the displacement anywhere along that Siebert fault?

A. No, not with any degree of accuracy; because the developments are all more generally in a north and south direction.

Q. Have you been able to determine that it was more than a given amount?

A. Oh, yes.

Q. More than a few feet?

A. Yes.

Q. How great a displacement have you been able to determine that it must at least have equalled?

A. Certainly more than a hundred feet, probably a good deal more than that.

Q. Is that always in a horizontal direction measured easterly and westerly or was there another component and downward dislocation?

A. Well, measured along the fault, it is; probably two or three hundred feet or more.

Q. How is that?

A. Measured along the fault it is in the direction of its movement probably two or three hundred feet.

Q. In an easterly and westerly direction?

618 A. That is in *an* northeasterly direction.

Q. Well, does either side of the country through which that fault cuts drop?

A. Yes, the hanging wall is slid down to a lower elevation in the trough of the fault.

Q. Does it slide directly down, or partially down and partially easterly?

A. Well, it slides directly down but the amount of the sliding down measured north and south is not so great as the amount if measured northeast and southwest.

Q. It has dislocated the country in two directions, easterly and westerly and downward?

A. Oh, no.

Q. Has it dislocated the country at all on either side of the fault?

A. Yes, very materially.

Q. In more than one direction has it dislocated the country?

A. We are working under a confusion of terms.

Q. Well, straighten me out.

A. I will take a sheet from my note book and show a mass of over riding rock, starts up at this summit and moves in a northeasterly direction a very considerable amount. It will be observed that it is possible for the dislocation from its original position here, measured in a north and south direction to be very small, whereas its displacement in an east and west direction would be very large, and yet, it is the same mass of rock that has been moved.

619 Q. Well, did the hanging wall of that fault,—the hang-

ing-wall country move down as well as easterly relatively to the foot-wall side of the fault?

A. It moved northerly and easterly.

Q. Did it dislocate what we call the north dipping vein?

A. No.

Q. At no place?

A. No; merely rubbed the top of the massive quartz in it and took away a zone of stringers.

Q. And had nothing to do with the deposition of minerals and it has nowhere dislocated and displaced the vein itself?

A. No; it had nothing to do with the deposition of minerals because we find in the cracks of the vein or fault, the minerals ground down into the vein itself.

Q. It is merely post-mineral.

A. Yes.

Q. What figure, or what part, did this Siebert fault have to do in determining what the strike, or course, or dip or top of this vein is?

A. It has not materially affected the form of the vein at all.

Q. I repeat the question. What part, if any, did this Siebert fault play, in your determination of what the strike or course or top or dip of this vein is?

A. To my mind it had no affect at all except upon one particular thing. My view of the vein is that the outer boundary of it should, geologically, include the zone of stringers; there is a solid band of stringers which is more the miner's vein than the geologist's vein. The miner's vein, the solid part of it, is intact and unaffected
620 by the Siebert fault except at some places where they are in contact there is a little crushing.

Q. But no deposition?

A. No deposition. The hanging-wall fringe of stringers has been at certain parts locally removed from the solid part of the vein.

Q. By the Siebert fault?

A. Yes.

Mr. Dickson: If your Honor please, I was in hopes I could get through with the cross-examination this morning, but I do not feel like going on; I have neuralgia very badly and do not feel like working, and I understood from some of the gentlemen connected with the case that your Honor had to go to Goldfield and would be agreeable to going to Goldfield to-lay instead of tomorrow.

The Court: Well, I cannot do that, Judge Dickson, because the two cases are set there for tomorrow, but if you are not feeling well I will shorten the sessions.

Mr. Dickson: Well, I will try to go on a while this afternoon.

The Court: Well, why not take a rest until this afternoon?

Mr. Dickson: Very well.

The Court: This case, then, is continued until 2 o'clock this afternoon; Court will remain in session until 12 o'clock for whatever may come before it.

621 14.

December 15th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

JOHN W. FINCH on the stand for further cross-examination.

Mr. Dickson:

Q. As I understand on these sections on the glass model, exhibit 3, on your direct examination you included the Siebert fault, where it is sketched in in broken lines, is a projection based upon observation made elsewhere?

A. That is the intention, yes?

Q. Point out on section one as you go down raise 488 where you have ceased to depict the Siebert fault, an unbroken line and where you have commenced to depict it as a broken line; how near the bottom of raise 488, you have changed the solid line to a broken line?

A. Well, it should be changed immediately below, and it is. There seems to be some dotting along the raise itself which should not be done because it is absolutely developed there.

Q. It should be a full unbroken line as far as the raise follows the fault?

A. Yes. It is shown clearly on the paper section from which that was reproduced.

Q. And on that section there from the top of the 488 raise upward, and from the bottom of it downward, the Sievert Fault should be depicted in unbroken lines?

A. Yes.

Q. You have nothing above the top of the 488 Raise, nor below it in that section,—nothing but a broken line showing the fault?

622 A. No, because it projected for a certain distance downward into the Tonopah Mining Company's level in that section.

Q. Practically depicted as a broken line from top to bottom on this section except where the 488 raise follows it?

A. That is true. And for the reason that that is the only working on this section where it is developed; at a short distance away from the section,——

Q. Take section 2 in Exhibit 3. Where, if at all, have you the fault developed by any line of works apart from which the fault in its upward and downward course is depicted as a broken line?

A. At points where it is developed in the West End workings, and in drifts and raises and cross cuts for a considerable distance at and above the four hundred level, and downward in 573 raise,—it is shown as a solid line.

Q. What is your distance there approximately?

A. Oh, about 150 feet.

Q. Apart from that the fault on that section is represented in broken lines?

A. No, except where it is developed in this plane of section, except its position is determined. Developed in 400 level of the Jim Butler.

Q. Developed back in the raise?

A. Yes, sir.

Q. The width of the raise?

A. So that it becomes the position of the fault.

Q. For the dimensions of that raise only, you mean?

A. No, I mean the position of the fault for that cross section, because there is no other feature similar to this fault in the cross section.

Q. Well, there is no other place where you have it actually developed in the plane of that section?

A. Oh, yes.

623 Q. Going to the number three sheet, where have you it actually developed in that?

A. We have it developed near section three in the cross cut of the Tonopah Mining Company, at the extreme east end of the section; near enough so that it might just as well be represented as a solid line there, whether it is or not, I cannot see. Then in the four hundred workings of the West End, above the four hundred level along the top of the stope, and then developed for some distance along the top of the stopes.

Q. Right there along the top of the stopes it is not actually developed except at intervals?

A. Well, very close intervals.

Q. Maybe I can save time. At least wherever the fault on anyone of those sections is represented as a broken line, it has been projected, and is therefore not put in in solid?

A. That is the principle of representation?

Q. And taking each section by itself the workings are depicted thereon, which would cut the fault?

A. Yes.

Q. And under the fault any piece of work is extended in connection with the fault?

A. Well, that is not strictly true; it has some correlation in the section with workings immediately at hand, and shown better upon the plan map in Exhibit-2.

Q. You have shown upon each of these sheets every piece of working actually cut by the plane of section?

A. That is true.

Q. And each section would show the distance where the fault was followed or cut by any line of working?

624 A. Yes, there are some places where the solid line and such positions as in section-5,—for instance where four points near at hand—so near at hand that anybody who looks at it with any care, could not be mistaken in it as the same fault,—where a solid line has been drawn through those four points; it is not a continuous development but amounts to the same thing.

625 Q. It would show the extent where it was a continuous development and where it was conjectural, it had been projected?

A. Yes.

Q. Do I understand that in the raises 488, 2 A, 4 A, 5 A, 6 A and 7 A that those raises are put up on this Siebert fault?

A. They are.

Q. Just step to Defendant's model, Exhibit A, where we have the distinctive colors of the two veins for a moment. At the bottom of 488 raise, starts at a small stope, does it not?

A. It is not exactly a stope, no.

Q. It is larger than a drift, that is why I supposed there was some ore taken out there?

A. I think not. It is mostly gouge matter of the fault. It is the top of the raise, it is not a stope.

Q. It is beneath the bottom of the raise?

A. Yes.

Q. Hasn't that been stoped out?

A. I think not. Just merely a raise, a continuation of the raise that breaks over and crosses the level.

Q. It is very much larger than 488?

A. Yes, paved down there, apparently.

Q. Isn't there any ore in that?

A. I think are seams of ore in that; it looks like it.

Q. A part of the MacNamara north dipping vein, or that portion of the MacNamara vein that takes northerly, the way that is there, beneath the bottom of 488?

A. Extending over and running up from the main vein.

Q. It is a part of the MacNamara north dipping vein?

626 A. In that sense, yes. I can answer that question best and most explicitly by the drawing which was made on the ground.

Mr. Lindley: Just mark it, "Finch X 1."

The Witness: The main body of quartz lies at a very considerable distance below the point which you mentioned, which is here. There are seams of quartz which I have represented in red, and they might assay considerably for all I know. But there are upward extensions of the stringer zone.

Q. We will come to that maybe later on. Designate this line of work in some way.

A. Well, that whole system of work has been called the 569 raise, the original 569 raise running up and connected with the level.

Q. This is not a raise where you have 569?

A. Well, they call it a raise.

Q. It runs apparently very near horizontal?

A. It is just along the summit.

Q. Isn't that a cross cut between the north dipping and south dipping flanks or side of your anticline?

A. It is not. It is a working which follows in an arched form on the principal ore streak of the anticlinal vein.

—. How deep is the quartz there below the plane of juncture between the two veins? How many feet?

A. It is right at the juncture.

Q. And how far below it does it extend?

A. That has not been developed, I do not know. It extends certainly a number of feet because it is shown in 537 raise to extend somewhat in the way of seams below that solid body of quartz.

627 Q. Have you no idea, Mr. Finch, how far above this line of work beneath which you have placed that mark—how far above that line quartz extends above in its upward course until you come to a junction of the two veins at the crest of the roll?

A. The working is itself along the continuation of the vein. It is not a junction.

Q. Let us see if I can get at it this way: haven't you quartz above that line of work?

A. Stringers of quartz.

Q. Haven't you quartz above that line of work clear up to the junction?

A. I don't know of any junction of any two veins in that section.

Q. Well, the crest, then of the fold, the bottom of the crest of the fold, the bottom of the two hanging walls at the point where you turn from the north dip to a south dip. You know what I mean? Haven't you crossed above this line of work marked here on this Finch X exhibit?

A. I know what I found in the ground. A solid body of quartz continuously between 537 raise and 569 raise, and above that body of quartz other stringers of quartz—no, change that; stringers of quartz extend up from the main body for a very considerable distance up into the 400 level, and above the 400 level into 488 raise, which I now mark, and up and against the Siebert fault.

Q. That is a long way from what I am speaking of. I am speaking of this cross cut.

A. Well, I do not understand the question.

Q. 569 was marked here "569"?

628 A. Yes, in westerly.

Q. Haven't you quartz in the floor of that?

A. Yes.

Q. From end to end?

A. Yes.

Q. Haven't you quartz in the roof of it from end to end?

A. Not solid quartz in the roof from end to end.

Q. Substantially?

A. There are stringers of quartz for part of the distance in the roof of that.

Q. If the quartz extended up to the hanging wall of the north dipping vein over this cross cut 569, you could have given that line of work under which you have placed the figures "569" even a more pronounced curve, couldn't you, depending upon the line of work?

A. This is just exactly the way the quartz lays in the ground and was mapped with great detail and great care.

Q. That is the way the work lies in the ground, isn't it?

A. The red lines are the way the quartz lies in the ground.

Q. As cut by that line of work?

A. Yes. The 569 in pencil indicates the working just driven upon the miner's part of the vein.

Q. And beneath that, in the floor of that from end to end you have quartz?

A. Oh, yes. More vein stringers show down 537 raise.

Q. Aren't there places where you have bodies of quartz between the north dipping and south dipping flanks or branches or sides of the anticlinal fold beneath the point of the junction of the two, where you turn from a south dip to a north dip? In other words, at the crest or beneath the crest, quartz in sufficient size that you
629 could run a line of work in the form of a complete circle and have quartz above and below every inch of the way along that?

Q. You could do that, but you can not follow any structure in doing so.

Q. The structure, or intervening country is not conformable, is it, beneath the arch or crest?

A. The structure of the quartz is conformable.

Q. You have there north and south fissures, have you not?

A. Cracks formed in the quartz, not structure of the quartz. There are cracks—permit me to explain to make myself clear—those cracks cut through the structure of the vein. The structure of the vein is marked by the streaks of ore in it better than anything else, and those streaks of ore are continuous over the ridge.

Q. Is the structure of the vein, then from the crest of the fold as you go northerly followed in its downward course at a regular dip to the north, vein material, quartz?

A. Oh, it is a waving, undulating form on both sides of the summit.

Q. But does it conform in its downward course, the structure of the vein material, quartz, to the course or direction upward of the north branch, the north side of the roll? Do you understand?

A. I don't believe I do, Judge.

Q. As you go down on Section A on the glass model, maybe you have better go farther to the west where you have more extensive developments in ore.

Mr. Lindley: Section A on the glass model?

Mr. Dickson: Section 1 is it?

630 Mr. Lindley: Yes.

Mr. Dickson: I withdraw that question and put 1 at the westerly end where you have larger bodies of ore developed on the north dipping vein, or the north side of what you call the fold. As you go down this most westerly stope from the crest of the roll at the west end, does the quartz, as you follow it down, have the structure, the position—I mean by that the direction that the hanging wall of the vein has?

A. Oh, yes, it has the direction which is shown by the stope work-

ing itself. And the structure of the vein is shown best by the very streak of ore which the miners excavated.

Q. That is true of what we call the south dipping vein also?

A. Yes. They are both exactly alike in that respect.

Q. And do you mean to say that throughout, beneath the arch of the crest where you have continuous quartz from the south dipping branch to the north dipping branch for a hundred or 200 feet in length, between the two, that the structure there of that quartz, that intervening quartz has on one side a north dip, and on the other side a south dip?

A. Oh, yes. Section——

Q. That will be one of the points that we want to invite attention to—the Court's attention.

A. Section No. 2 shows that pretty well, or any section.

Q. Well, is it generally true——

A. Yes, it is generally true.

631 Q. That the quartz lying between the north dipping side of your anticlinal fold and that found between the south dipping side of your anticlinal fold, no matter what the distance may be on the hanging wall of one to the hanging wall of the other, that the intervening quartz has, on one side of this body of quartz a northerly dipping structure, and on the other a southerly dipping structure, and is that true throughout from one to the other?

Mr. Lindley: One moment, Mr. Dickson. Do I understand you to mean that zone that underlies the arch of the crest?

Mr. Dickson: Yes; that intervening country.

Mr. Lindley: And intervening between the footwall of the north dipping and the footwall of your south dipping?

Mr. Dickson: Yes; or the hanging wall of the north dipping and the hanging wall of the south dipping. Do you mean to say that all that intervening quartz between the hanging wall of the north dipping, and the hanging wall of the south dipping, lying below the crest of the arch has either a south dip or a north dip——

A. Yes, I do mean to say——

Q. From one end to the other?

A. I do mean to say exactly *there*. I will illustrate, if I may be permitted, what I mean by that statement. Over the crest of the arch there is usually—generally a flatter lying footwall streak, which is a stoping streak the miners follow.

Mr. Lindley: You are now referring to the exhibit which you will kindly mark "Finch X 2."

632 The Witness: The stoping streak which the miner follows and have followed in a great many cases lies rather flatly like that (indicating). The stoping streak carrying ore,—a part of the vein. Stringing up on the south side and the north side of the vein there is one or more other streaks of a somewhat similar nature, and in some places also stoped so that there is one stope overlying another. Each of those best mineralized streaks in the vein are continuous over and across the ridge. Now that is the structure of the vein.

Mr. Dickson:

Q. Now below the lower arch or crest, will you draw a line there, a cross section from north to south, taking the bottom——

A. A horizontal line?

Q. Yes. What scale is this supposed to be?

A. No special scale.

Q. Well, for a distance in many places below the crest of this bottom roll represented here on "Finch X-2" have you not quartz, solid quartz, extending down twenty or thirty or forty feet, and occupying the intervening country between the two branches or sides of that fold?

A. I think that we are referring to the same thing when I state that the intervening quartz which you mentioned, is the solid quartz, not commercial, lying between the two ore streaks of the vein.

Mr. Lindley: Mr. Witness I think that counsel wishes to take you below your lower red line there?

The Witness: Well, if he takes me below the lower red line and the thing which I am attempting to illustrate, we pass from solid quartz into a fringe of stringers. The solid quartz which has
633 been mentioned by Defendant's witnesses, and I understand perfectly well, and it is a quartz which lies in this intermediate area and is developed, for instance 573 and 571 raises, and 569 raise, shown in the sketch.

Mr. Dickson: Well, take that section of the country represented in "Finch-2" lying between the two heavier streaks of ore or quartz, whatever it is, is that solid quartz from the south dipping to the north dipping side of your crest?

A. It is, in a number of places.

Q. To what depth?

A. Solid quartz, but non-commercial.

Q. To what depth?

A. You can get it exactly on one of the sections.

Q. I mean as a maximum, thirty or forty feet in places.

A. Here is a cross section precisely in which we can scale the width of such quartz.

Mr. Lindley: Referring to what cross section?

Mr. Dickson: Cannot you answer my question without that?

A. I am going to give you the distance, I will give it approximately from the model. Section three for instance illustrates that condition; section four illustrates a condition in which there is solid quartz for a part of the distance, the balance a combination of stringers, also for a part,—but in section three there may be a distance of forty or fifty feet of solid quartz.

Q. Now, that quartz does not carry any values when you say that it is not commercial?

A. It looks like solid and rather barren quartz, but it is solid vein quartz.

Q. It is a part of the vein?

A. Oh, yes.

Q. Now, does that in-ervening quartz that you have referred to on section number four,——

A. I referred to that on section number three, which is
634 similar in appearance to the vein and more solid quartz than this is.

Q. Which is section number four?

A. It illustrates the arrangement.

Q. Does all of that intervening quartz—and what I mean by intervening quartz, the quartz found in the intervening country, or the country between the hanging wall on your north dipping quartz, or strike of the roll, and the hanging wall of the south dipping side of the wall, have throughout, from end to end—have a structure either north and south or northerly and southerly?

A. No, it does not; it has a structure which conforms to the anticlinal roll.

Q. The cross fractures has modified it, the structure?

A. No, they have not; the structure was all made before these cracks were formed.

Q. Do you not have that intervening country in quartz which dips neither to the south nor to the north?

A. Oh, there is a point always in the anticlinal roll, where the thing in passing from one dip to another is almost horizontal.

Q. Do you mean to say that apart from that plane that that intervening body of quartz found anywhere between the crest of this roll, has either a dip to the north or to the south?

A. Oh, no question about it; its boundaries dip to the north.

Q. So anybody going in there could see that the quartz throughout was either dipping to the north or to the south, and if taken in places—I do not mean the mathematical plane, at the crest of a roll,—apart from that, more extensively than that, standing vertically, and in places dipping to the east and in places dipping to the west, instead of the north or south?

A. I will say with reference to that, that in the core of this mass of quartz at the summit of the anticline there are places which
635 you can look at and not see a definite structure of any kind, but, if you follow through the workings you will find overlying it and underlying it, definite streaks of ore which pass in the form shown by these darker colored lines, and that is the structure of the vein; the included quartz between those bands is so massive as not to show any dip or structure at all, merely because it is massive.

Q. Now, going back to defendant's model, Exhibit-A, as I understand you not only does raise 488, but Raise 2-A and raise 4-A, 5-A, 6-A and 7-A follow up from top to bottom the plane of the Siebert Fault?

A. They do except down to the bottom of a raise like 4-A for instance, the fault shows just beyond the bottom towards the north in the wall of the stope and then just a little above the bottom of the raise.

Q. And they go up on an angle to the south practically the same angle of the north winzes of the north side of your anticlinal fold,—on up, without any change in the angle of dip?

A. They have been so driven that they produce that effect, but they are driven upon a fault which has a dip differing from the dip of the north slope of the vein.

Q. But as those raises have been extended to the one in which the roll — taken, apparently, they have the same dip as the hanging wall on the north side of the vein?

A. Yes, because they are driven diagonally on the fault.

Q. You understood all along did you not, from the time that you first came into this case, that the Jim Butler Company had a stipulation with the West End company, by which it could have prosecuted by the West End company any piece of work that the Jim Butler company wanted done?

A. Yes, sir.

636 Q. If you thought these raises 2-A, 4-A, 5-A, 6-A and 7-A had been run up in such way to deceive or mislead, in the respect that you have stated, why didn't you suggest that another raise be put up on the true dip of the fault fissure, showing that it had a different dip from that of the hanging wall on the south dipping branch, or south side of your anticlinal fold.

A. It was sufficiently ovbious so that I did not think that it was necessary. The top of the fold is in position about as I hold the pencil, transversely across the raise, and the strike runs across on the outer edge and strike, finally to the north, so that the fault is perfectly clear.

Q. Is it true that the ordinary intelligent observer going in there and looking at these raises, and stopes, would get the impression that each of those raises went up on an angle of dip conformable to the dip of the hanging wall, of the south dipping, or north branch of the anticlinal fold?

A. They actually do go up—from the stopes.

Q. Do you think that you could have done work in that neighborhood put up another raise, that would have presented a different appearance, to the true appearance and would it show that the raise was, if it went up on the true dip of the Siebert Fault would be going up in a direction, angle, different from the dip of the hanging wall of the north branch of your fold?

A. Different in direction of dip, such a raise would extend in just about a due southwesterly direction and that would follow the actual dip of the fault, as it is developed in the Tonopah Mining company, and all this region. The dip of the vein at that place is considerably less than the dip of the fault.

637 Q. And you plainly observed that these raises have been so driven to show to the ordinary observer that each and all of the raises went up on the same angle, and direction of dip as that of the hanging wall as that of the north branch or side of your anticlinal fold, you did not direct that any additional work be done in the way of raises, which would disclose the misleading effect in this raise?

A. Oh, they do not mislead, except if they are intended to show the direction of the dip of the things which they follow, they do not do it.

Q. Well, you heard the testimony of the witnesses for the defendant, didn't you understand that that was their claim, that it went up on the dip of the hanging wall fissure?

A. I didn't know that they said that. It is easy enough to see; you can measure the angle or strike of it.

Q. Isn't the north branch or north side or north dipping side of this branch of your one vein in the fault and isn't it along a fault,—I do not say the Siebert Fault?

A. It underlies a fault plane.

Q. Doesn't it lie conformable to a fault plane?

A. No, I would prefer that the fault plane lies locally conformable to the vein; that is, it runs along the hanging wall of the vein.

Q. That is not the Siebert Fault?

A. Yes.

Q. The Siebert Fault lies in what form?

A. Only in that local sense, that it touches and follows the hanging wall for a certain distance.

Q. Do you say that the north dipping side of this north vein of yours does not lie in a fault, practically from one end to the other?

A. I do not think that is a Fault plane in the sense that there is any considerable displacement.

638 Q. Do you say that this north dipping branch or side of this one vein of yours, does not lie in a fault plane practically from end to end?

A. No, I do not think that it does. It — a fault plane,—it lies in a fissure zone, and the fissure zone may have had some displacement; to that extent it may have been a fault.

Q. Then is it your opinion or conclusion, from your observation, that the north dipping side of your anticlinal fold, lies in a fissure from end to end?

A. Oh, yes, that is true.

Q. And the dip of that fissure is conformable to the dip and course of the ore body?

A. Yes.

Q. And conformable to the strike and dip of the fissure?

A. Yes.

Q. From the most westerly end of the development to the easterly end of the development, in the West End ground, or the End claim?

A. That is true, true in both sides.

Q. That is true in both sides?

A. Both slopes.

Q. What is there at the bottom, I will say of four-A raise, and I do not confine you to the dimensions of the bottom of that raise,—but to the country immediately adjacent?

A. The bottom of the 4-A raise is followed curving over on the vein structure, immediately above the bottom and connecting with the stope is a very prominent quartz stringer, that goes right——

Q. Right up at the top of the stope?

A. It goes out of the top of the stope and passes up the raise a little distance and is cut off.

Q. How far does it pass up before it is cut off? Isn't there quartz in the top of the raise?

639 A. That prominent stringer is cut off about two thirds of the way up.

Q. So that two thirds of the way up 4-A raise, you have been following a body of quartz of considerable dimensions, clear from the bottom where you started in to stope up to that two thirds distance?

A. I will state however that it does not differ in genesis and character from that found at other points in this raise and the other ones.

Q. Well, we will get to that further on. Now, at the bottom of the 7-A raise, you have a stope there in the north dipping vein, or the northerly side of the anticlinal roll?

A. Yes, we have a stope that comes over and makes a sharp arch.

Q. Do you now go up in quartz in that stope without any interruption, up into the 7-A raise?

A. We go up into the stringer zone, 7-A is especially distinguished.

Q. You have quartz?

A. Little bodies of seams.

Q. It goes up following a body of little seams?

A. Crossing the seams and following a fault.

Q. From the bottom of the stope clear to the top, what would be the dimensions of the quartz body, that is followed up in 2-A raise?

A. There is not any quartz followed up; there is a number of stringers of quartz found, and some of them have been dragged along with the fault, so that fragments of quartz can be found underneath the fault and in it for a considerable distance.

Q. How about 5-A raise?

A. The same thing can be stated about 5-A.

640 Q. Haven't you there a body of quartz from two to three feet thick, which you followed up continuously for about forty five or fifty feet, up the 5-A raise—starting in the stope at the bottom and going right on up?

A. There is a conspicuous interlacing series of stringers going up 5-A raise for a considerable distance,—forty seven feet I think, as I measured it—and then that turns up against the fault and is cut off sharply and disappears.

Q. Did you say that you followed it from the bottom of 5-A raise upward for forty five or fifty feet, that it could have been anything but a solid body of quartz?

A. Oh, no, there are individual bands in it for considerable width.

Q. You have bands down in the stope?

A. We have bands down in the stope and extending up the hanging wall the condition is exactly similar, with reference to the stope at the bottom of those raises and the other stopes of the mine; there are stringers, sometimes big ones extending up into the back of the stope into the overlying rock.

Q. I am not speaking about that. Now in the stopes themselves below the hanging wall and below the foot wall boundaries, wherever it may be haven't you stringers of ore, quartz?

A. Those lighter areas—colored areas in the section between the

dark colored areas, represent the best mineralized areas,—these lighter areas are quartz seams.

Q. In the stopes?

A. Within the vein, yes.

Q. Within the vein, in the stopes?

A. In the stopes. Sometimes the little seams themselves are stoped, because the little seams running through it are rich enough to make it ore.

641 Q. Was there stopeing going on on the northerly side of this vein, I mean the north dipping side of the vein, during your examination made in order to prepare yourself to testify in this case, to qualify yourself?

A. I think not.

Q. Did you see any evidence of any recent mining there, stopeing?

A. No; I understand that the MacNamara has not been working for sometime, I know that most of the MacNamara workings have a coating of dust over everything, as if the work had been done a long time ago.

Q. If you had a clay gouge on the hanging wall of that north dipping vein, and the ore was mined out through a contact with the gouge seam, and the remaining gouge seam was left exposed to the influences of the air, wouldn't you expect it, to cleavage or fall off?

A. I think that has happened in some of those caved places.

Q. That is what you would expect speaking generally?

A. Yes.

Q. So you do not pretend to say, I take that, that there was not generally speaking, or throughout the stopes in the MacNamara vein, on that side of your anticlinal fold which dips to the north, a gouge seam on the hanging wall of the vein?

A. No, I would say definitely that there was a gouge seam on the hanging wall of the stopes which had caved and the gouged seam was the Siebert Fault.

Q. No, I mean apart from the Siebert fault. All these great stopes shown on Plaintiff's Exhibit-2, as extending from the crest of the fold northerly, are not on the Siebert Fault, are they?

A. No, a very small part of them.

642 Q. I am speaking of that particular body of stopeing,—you don't mean to say that when that stopeing went on from day to day or week to week, that a clay gouge was not encountered in the upward termination of the stope as it lay immediately beneath the hanging wall, that there was not a gouge seam separating the ore from the hanging wall rock?

A. No, I would like to be perfectly explicit on that. There is, outside of the area where the Siebert Fault touches the vein, there is usually a parting, sometimes with no gouge in it, and at other times very little gouge in it,—an amount of gouge which does not compare at all; very much smaller than the gouge of the fault, nevertheless, a small clay slip on the hanging wall in such regions for instance as this part of the MacNamara stope. There are similar gouges down in the West End, where the fault referred to as the

Edwards Fault, in cutting across the vein swings in and forms the hanging wall.

Q. I am not speaking of the relative size or the relative thickness of the gouge seam,—there may be larger in one of the faults than the other. But — I want to get at, is whether you are able to say that throughout these large stopes, following down from the westerly crest of the arch northerly, there was not a gouge seam lying between the ore and the true hanging wall rock?

A. No, the true hanging wall rock is very seldom developed. In very few places developed in the workings on either side of the ridge. There is a slip on the hanging wall, which has from almost no gouge up to a considerable, amount in the vein itself, between the ore shoot and overlying the vein matter.

Q. Have you reference to the little stringers?

A. Sometimes pretty solid quartz above the stope.

643 Q. Speaking generally of that line of faulting are you able to say,—I do not mean every foot of the way, but *wh*hat there is not found a gouge seam of clay separating the ore from the true hanging wall rock?

A. I will say that there generally is such a seam, as I have qualified it in a previous answer.

Q. And that seam is not as thick as the gouge found in the Siebert Fault?

A. Oh, no.

Q. Isn't the seam of gouge in the Siebert Fault thicker in some places than others?

A. Oh, yes,—that is characteristic of faults in general.

644 Q. And what is there, please, where you find in the Siebert fault a gouge seam not thicker than you would find underlying the tru*w* *handing* wall of the MacNamara vein, the north dipping vein?

A. I do not recall such place.

Q. What do you say as to whether or not the ore found in these raises, 488, 2 A, 4 A, 5 A, 6 A, and 7 A is ore or quartz in place, or drag ore?

A. Both.

Q. Which predominates?

A. Along the under side of the fault, the drag quartz predominates.

Q. The under side of the fault?

A. Yes; a short distance from it it is practically in place, although bent over, as I described it; at the top of 5 A raise, the Fraction vein comes up and turns over horizontally by the downward pull of the quartz.

Q. Where was the drag quartz pulled from? These raises go up to the cap rock, do they not?

A. Probably pulled away from quartz stringers near at hand in the foot wall of the gouge or fault.

Q. What are the dimensions of those raises, the ordinary size, 3 or 4 feet by 4 or 5 feet, I suppose?

A. Yes.

Q. This A series?

A. They are caved down in a number of places and enlarged themselves by falling in with the fault material, so they are a little larger than usual in places.

Q. And you think that the quartz found in thise places is drag quartz?

A. Not entirely, no.

Q. Was dragged in from some of those little seams that
645 have made out into the hanging wall?

A. Some of those little seams are right there in the raises.

Q. And where did the quartz that is in place come from?

A. Comes from the hanging wall of the vein, excepting the Fraction vein which shows in five A.

Q. What is that?

A. Excepting the Fraction vein which shows in 5 A.

Q. Will you get that Finch 1, please?

A. That came along from the Fraction fissure itself.

Q. We are not particularly concerned with the Fraction fissure just now. Let me see Finch 2.

A. (Witness does so.)

Q. Finch 3?

A. That must have been one of those prepared cross sections.

Mr. Colby: Finch 3 is cross section 2.

The Witness: May be identical with the glass sheet. One of the prepared sections.

Mr. Dickson:

(Q.) Finch 1 is probably what I had in mind. Pull down Finch 1.

A. Glass sheet No. 2 would be Finch 3. The second one.

Q. You have a perfect network shown on Finch 1 of little seams or fissures extending into the hanging wall and foot wall country?

A. I do.

Q. What developments are there along that plane of section to shows that?

A. Well, this is a section which might be almost anywhere.

Q. And was there any purpose, Mr. Finch, in drawing that portion of the section which represents a cross section through
646 this vein and placing it practically on a horizontal line with little undulations?

A. Yes, because I believe that is the form it had when it was made.

Q. It is not the form it has now?

A. No, it may have been changed.

Q. When do you think it had that form, how many centuries ago?

A. Oh, I don't know.

Q. It is a matter of conjecture whether it did have that form, isn't it, speculation?

A. No, the probabilities are that the rocks under which it was

formed lay much flatter and much more regular than it is now, because there has been a number of volcanic eruptions since this ore deposit was made.

Q. Those eruptive rocks would conform to the surface of the country as it was at the time they were poured over the country, of course?

A. Yes; oh, yes.

Q. And whether the surface of the country was then horizontal or even more irregular than it now is is a matter of conjecture?

A. Oh, yes. I would not be sure whether it still has approximately its original form or not.

Q. What are the thicknesses of these little seams which you have represented here on what you say would be considered an ideal——

A. As you see those passing up from the stopes all around the mine, they range from the thickness of a foot or more down to mere seams.

647 Q. Generally speaking, what are they? Just mere seams?

A. There are thousands and thousands more *more* little seams than there are the big ones. The big ones are rather rare, but they do occur. This rock shows the little seams and part of the replacement of the——

Mr. Lindley: Let us identify it so we — know it in the record.

Mr. Dickson:

(Q.) I wish you would mark this, Mr. Finch, before I ask you a question on it.

Mr. Lindley: "Finch X 3."
(Rock so marked.)

Mr. Dickson: Now, will you point out to us, point out to his Honor the little seams that you have reference to found in here going out into the hanging *ot* foot wall country?

A. These are little seams of quartz which I intended to represent by these lines stringing out from the vein, and they vary in size from this up to a very considerable width. But they have the same relations with one another, they interlace and branch out like the branches of a tree.

Q. These on here are simply mere thread-like seams?

A. Some of them are. Some of them are an eighth of an inch thick, a quarter of an inch thick, but they show the way they cross one another. Such material as that is found also within the vein itself between ore streaks.

Q. I did not hear your last answer.

A. Such a criss-cross arrangement of the seams is also found within the mass of the vein between the ore streaks of it.

Q. And sometimes in the stopes themselves?

648 A. And sometimes for a long distance into the hanging wall.

Q. How far have you followed them into the hanging wall, a

seam of any dimension? What I mean by any dimensions, 6 inches or so, or more than that, or a foot?

A. Oh, they have not been followed because they offered no attraction to the miners usually, but they are cut in cross cuts and raises at distances of as much as 50 feet or so above the hanging wall of the vein.

Q. Wouldn't it be quite speculative to undertake to identify those little seams where they are cut?

A. Oh, they don't go any distance.

Q. What?

A. No individual seam goes any distance at all, it turns off and intersects with others, just a mesh or net work like a chicken fence.

Q. No individual seam would be followed for any distance?

A. No, but they extend up and gradually disappear up the hanging wall of the vein, and they are just as much a part of the vein as the hair on a man's head is a part of the man.

Q. May be that *orio* or halo you spoke of. Did you follow any little seam or big seam which made out from the main vein into the hanging wall country or the foot country, having a size, quartz, unbroken quartz a foot or two feet for a distance upward of 30 or 40 or 50 or 60 feet?

A. Oh, yes.

Q. Or anything like that? Where, apart from these raises?

A. A series of them have been stoped in two different places. Have been stoped at least 30 or 40 feet above the main vein, the main body of quartz of the vein down in the Jim Butler.

649 Q. What has been stoped?

A. The hanging wall system of seams where they become specially large.

Q. Do you find any difference in the quartz which is in place in the A series of raises from that found in either the north dipping or south dipping branches of your 1 vein?

A. No. No, it is a part of the vein.

Q. Suppose, Mr. Finch, that we had every foot of the way from the West End—the east end of the west end claim to the westerly termination of the ore where you have this broken edge, the terminal edge, in your judgment, a series of raises like the A series of raises showing practically a continuity of ore in what you call the hanging wall, but above what you call the true top of the north dipping vein? Would you still say that they are small stringers into the hanging country?

A. If we found such stringers, I would not call them above the true top. The true top has not yet been reached if there are stringers.

Q. I did not hear.

A. The true top has not been reached if you are still having other stringers and going upward.

Q. I will modify the question: suppose we had at intervals of every few feet from the east end of the West End claim to the westerly termination of the ore raises going up from 30 or 40 or

50 or 60 feet showing quartz in place, and every one of them extending for those distances above the junction of the south dipping and north dipping branches of your vein, would you say
650 that the top of your vein was found at the junction below, or at the top of those developments that I have referred to?

A. I would say just the same as I say now.

Q. What?

A. I would say just exactly as I say now, that so long as a conspicuous stringer system existed, you are still in the vein.

Q. But, then, if you had the condition such as I implied in my last question, what would you call the top of your north dipping vein?

A. That irregular boundary where the silicification and the interlacing stringers becomes inconspicuous and changes into comparatively unaltered lode porphyry.

Q. I wish you would step to Plaintiff's exhibit C and starting at the westerly end point out the most extreme westerly ore developed on the 500 level in this vein, the south dipping vein? Start with the most westerly development of ore on the level?

A. Most westerly ore?

Q. Developed on that level, the 500 level of the West End?

A. As shown by the stopeing?

Q. Give us the figure there. In the vicinity of what?

A. You want it exactly on the level?

Q. On the level, yes.

A. It is not quite so far in the levels there as it shows in the stope above.

Q. I do not mean stopeable ore, but the vein cut on that level?

A. That is where it meets the dacite cap rock at the point where the two prongs branch out.

651 Q. From figures 1077—station 1077 on Exhibit I?

A. There is sstill some of the vein left over as far as 1078.

Q. At that level?

A. Yes.

Q. Well now, we will go on: take that level up from there easterly and state to the Court where on the level, either above or below it, you have ore exposed, or unmistakeable vein matter, a portion of this vein we are talking about?

A. It is unmistakeable vein matter——

Q. Giving the stations, Mr. Finch, if you please, so it will go into the record.

A. I was about to make the general statement that it was unmistakeable vein matter throughout the length of this level in this main drift. That is, if we start from the west end and pass around to the northerly drift. That is close to the sideline of the claim.

Q. They are both on the same level?

A. Yes, but this is not ore material. This is vein matter on one side of the drift, and that Edwards fault along here on the other. Then, there is vein matter continuously through the level around to the end of the stope at the end line of the West End claim.

Q. The east end line?

A. That is vein matter.

Q. And a portion of what we call the south dipping vein, and what you call, I suppose, the south side of the anticlinal fold?

A. Yes.

Q. For what distance, then, have you ore and unmistakeable vein on that branch of the vein, that side of the vein developed easterly and westerly on that level?

652 A. Well, the ore is probably just marked by the length of the stopeing.

Q. Well, give me the length on the vein then, first.

A. The length on the vein is——

Q. On that level?

A. In round numbers, about 1150 feet.

Q. Now, to what extent on that level, and giving the westerly and easterly termini of each stope, section of stopeing, have you ore developed, merchantable ore?

A. Of course, in answering this, I will have to state that there may be pay ore that I don't know about.

Q. So far as you know?

A. That is developed and has not been stoped.

Q. I mean developed ore; I think I said that in my question, ore developed?

A. Well, the best I can do is to mark these—to measure the length of the ore extracted. I am not sure that there is any more ore in the mine.

Q. No, we do not know whether there is or not, of course.

A. About 680 feet.

Q. In one place?

A. On the westerly ore body.

Q. Well, go to the easterly ore body?

A. About 650 feet.

Q. Another stretch of stopes at the easterly end?

A. Yes.

Q. You gave me or testified that there was a fissure extending to the deep from the top, or what was represented in red as south dipping vein on each of the sections A, B, and C, and that the ore, vein matter was found in and along fissures where those several

653 planes were taken. Then you gave me the course of each of the fissures. I will ask you if that was just a rough estimate, or whether you have taken notes of the course of the fissure as cut by each of those sections at different intervals and determine- what its average or actual strike was?

A. I took the average strike for short segments of the vein, as you asked me to, from the skeleton model of Defendant, and of course, it had to be rough to a certain extent on account of the difficulties in taking it.

Q. You do not mean that to be exact?

A. Oh, no, it was the best I could do.

Q. This Finch 5 is intended to repres-nt the workings in ore, vein matter, I suppose, on the 400 level of the mine west end 400 level?

A. Yes. Up to a certain time.

Q. Up to what?
A. There is a little development since that was prepared.
Q. Well, that is negligible, I take it?
A. Yes.
Q. Would not alter the picture very much?
A. Very little.
Q. You have here on this Finch 5, in the vicinity of where the working marked McQuillan shaft, a representation of a broad toe or curve, as you come along on the south dipping vein easterly and turn around that broad toe and go back on what we call the north dipping vein; is there any such picture as that shown on the working on that level?

654 A. Oh, it is shown beautifully.
Q. I will call your attention——

A. Let me point out where it is shown. The foot wall side is developed almost continuously in a cross cut which I now indicate, a cross cut starting from Station F 36 and extending southward. Immediately over that cross cut, not 10 feet above the floor of this level is a stope which has been made upon this foot wall streak. The representation of it on this plan is just merely the projection downward.
Q. I am speaking more broadly, or intended to, rather, to invite your attention, more specifically to the eastern boundary of that toe.
A. That line represented in the heavy color is the solid quartz. Beyond that, the only solid quartz is shown in these patches of heavier color.
Q. Have you examined the Defendant's exhibit G on that same level?
A. Yes.
Q. With some care?
A. Well, with some care, yes.
Q. I wish you to examine it with great care, and when Court convenes again, which will be to-morrow morning—but in the meantime examine it with extreme care.

Mr. Lindley: I think the witness has examined it sufficiently to be able to testify.

Mr. Dickson:

(Q.) Are there any errors in what that exhibit purports to represent, so far as this vein is concerned?
A. I think there are. That is my opinion.
Q. Point them out on this exhibit.

655 A. If this exhibit, by a solid yellow color starting in the region of station 403 S—if by that solid yellow color it is intended to represent a solid mass of quartz, I can not subscribe to the representations upon the map from that point eastward.
Q. Can you say that it does not represent the vein?
A. Up to the point beginning back further west on the yellow representation—up to the point I have mentioned, I would agree with it in every essential detail.

Q. Well now, at what point, 400 and——

A. In the region of 403 S.

Q. Now, from thence on easterly, do you say that what is colored in yellow on the Defendant's exhibit is not on the vein at that level?

A. That is what I say. What I do say is, from the point 403 S, the mass of solid quartz as distinguished from country rock with stringers in it, turns sharply to the south and bends back to the south east.

Q. I wish you to be sure you understand me, Mr. Finch. Do you say that from the point which you designated, from thence on easterly, what is colored in yellow on Exhibit D, Defendant's Exhibit D is not in the vein, but is outside of any vein?

A. It is in the vein in the sense that it is a part of the overlying partly mineralized country rock stringer system which is left and not cut off by the Siebert fault. It ought to be represented, I think, in a fainter color.

Q. What?

A. I believe it ought to be represented in a fainter color, or else the details of the quartz in it should be shown by some con-

656 vention.

Q. If we had two typical fissure veins in a general easterly and westerly course, I do not mean due easterly by any means, and they were converging in their course, as you went eastward, and dipping in opposite directions, and they came to a juncture in their course eastward, as you went east where they first intersected each other, from thence on easterly you would be following on a descending plane to the east, wouldn't you?

A. Yes. You mean following down the summit of the ridge, if I may be permitted to call it a ridge?

Q. Yes. Now, if a vein in its downward course departs at all from the perpendicular and it outcrops at the surface, but the surface where it outcrops is irregular, the course or direction of the line of outcrop would, of course, differ from the true line of the strike of the vein?

A. Oh, yes.

Q. And the extent to which the direction or course of the line of outcrop would *be* depart from the true strike of the vein would depend upon two factors, I take it, namely the degree of the departure from the perpendicular in the downward course, and the extent of irregularities found on the surface along the line of the outcrop?

A. Yes. I believe I will have that question read; there may be something in it I did not grasp.

(The reporter read the question.)

A. Yes, I think that is true.

657 Q. Of course, that follows——

A. Yes, I wanted to be sure I understood what you mean.

Q. If we had again two typical fissure veins which converged in their course easterly, their strike being easterly and westerly and their dip in opposite directions, intersecting each other on their course upward, if we followed them from the point of juncture east-

ward we would be going on a plane inclining to the east, as you said then if at any point from thence on east they were parallel to each other, then that plane of junction would be a level plane, without it?

A. Yes.

Q. Coming to you- terminal edge in the western portion of the mine for a moment again, you indicated on your wooden model the local dip?

A. Yes.

Q. In a southerly direction near that westerly terminus.

A. Slightly south easterly.

Q. Yes. And this terminal edge on the south dipping branch is shown upon this exhibit 4, called terminal edge on the local dip?

A. Oh, no.

Q. On the local dip?

A. No, it lies between the local dip and the local strike.

Q. Well, it is a side edge in part, at least, that is exposed there, a side edge of the vein in its downward course?

A. Oh, no.

Mr. Lindley: I understood him to answer no.

Mr. Dickson: He said it was between the plane of the dip and strike. I do not understand he has answered the last
658 question.

Mr. Lindley: Yes, he did.

Mr. Dickson:

(Q.) Do you understand that last question?

A. I certainly do, yes. It is not a side edge. Any outcrop of a vein that is on a sloping surface is going to differ from the strike by as much as it passes down the hill slope. But in this case the outcrop of the vein is well above the line of the dip.

Q. Well, as we follow from the crest here where you have marked the northerly side line of the west end, we pass over that line downward to and across the southerly side line of the west end, are we going down on their local dip, or approximately to it?

A. Oh, no. We are going on a line——

Q. Going on the strike?

A. I will tell you just what we are doing: we are going on a line that I gave, an approximation of this yesterday; may differ a few degrees, but something like 30 degrees away from the dip of the vein and flatter.

Q. That is from what you call the dip; this surface on Exhibit 4 is intended to represent, as well as you can, the surface of the country as it was, I take it, at the time these veins were deposited, or before the later eruptive rocks flowed over that surface?

A. The yellow part of it, yes.

Q. I mean the red part?

A. Oh, no, the red part is the top of the vein.

Q. That is what I say.

A. That is the back of the vein.

659 Q. And represents the surface as it was before the overflow of the cap rock?

A. Oh, no. No, this is the surface that was overflowed by the cap rock and it has trachyte and Midway andesite under it in the hanging wall of the vein.

Q. This is later than the formation of the vein, this cap rock, isn't it?

A. Yes.

Q. Well, at the time this cap rock flowed out and over this surface which now shows the top of the vein and came down, wherever it came down on its contact with the top of the vein, that must have been the surface at that time?

A. Oh, that was——

Mr. Lindley: In other words, let me understand the question myself. Do you understand that this vein was formed with the entire top of it there to the surface when this flow took place? Is that your question?

Mr. Dickson: No, my question is this. I do not care much about it one way or the other.

Mr. Lindley: The question strikes me as a little bit confusing because that would indicate the formation of a vein on the top of the surface, and this representing the surface.

Mr. Dickson: Oh, no, I do not mean anything of the kind.

Q. In a rough way, it is what is shown on Exhibit 4 now in red, you have removed the covering?

A. Yes, removed the hanging-wall rock up to the fraction dacite breccia.

Q. Does this represent what the surface was before that later outflow?

660 A. Oh, no no. This represents what the surface was before the later flow.

Q. Oh, there was another flow after this one?

A. No, this is the Fraction dacite breccia; this was the surface it found to cover.

Q. What was the surface before that outflow came?

A. Before the outflow of the Fraction dacite breccia?

Q. Yes?

A. Just this surface on the top of the model and the surface painted yellow. In the hanging wall of the vein, there was still a considerable amount of lode porphyry, and above that midway andesite was eroded into a hillside, and this hillside is shown in yellow upon the model.

Q. I wish you would go to your model exhibit 2. Start at the east end and at intervals of 100 feet follow up on the south dip—the south dipping vein, as we call it, to where you come to the top of that south dipping vein, assuming now that there was no other vein than the south dipping vein, where would you find its top?

A. You mean at the time when there was the surface there before the Fraction breccia?

Q. I mean where the top of that vein would be found now, if there were only one vein there? Where would you find it?

A. Well, you would find the top of it under this same breccia, and it is shown——

Q. What I want to do, Mr. Finch, it may take a little time, not very long, though, to start at either the easterly or westerly end, as you prefer, and at intervals of 100 feet therefrom go up on the
661 true dip of the south dipping vein until you get to what you call the top of that vein, if there was no other vein there.

Mr. Lindley: That is on the assumption that the vertical plane as drawn across dropped down across that anticline and nothing beyond it?

Mr. Dickson: Yes, that there was no anticlinal fold at all. Designate the place on the model.

A. I will have to hear the question.

Q. What?

A. The question is difficult to comprehend.

Q. I will ask the question again: start at the east end, or at the east end line of the West End claim, and taking what the Defendant claims to be the south dipping vein, not the Fraction vein or any other, and follow up on the line the true local dip until you come to a place on the model where you find the top of that vein, if it were the only vein in the ground.

Mr. Lindley: That is assuming that there was nothing rolled over on the other side.

Mr. Dickson: That is it, exactly.

Mr. Lindley: Well, the model evidently shows that.

A. You would follow that vein up along the series of dips something as I now indicate up to an outcrop against the Fraction dacite breccia.

Mr. Dickson:

(Q.) Well, if it would take you too long to answer that question—that is not what I wanted. My question was to take it at intervals of a hundred feet and fix the point upon the model where you found the top of the vein, assuming that there was but the one vein, or if two, that this was a distinct vein from any other? It won't take
662 you very long.

A. No, I don't think so. A series of stopes——

Q. I want *ti* done with some accuracy.

A. A series of stopes starting with the stope known as the old MacNamara stope, passing down through stope- 6 and 5, 3, 22, and 21, 23 and 18 in the east end of the claim would be passing down from the outcrop towards the south easterly corner——

Q. You are not answering my question, Mr. Finch. My question is starting here at the westerly end or easterly end as you please, and then at intervals of a 100 feet go up on the dip of the vein, its true local dip and fix the place on the model where you found the top of what we call the south dipping vein?

The Court: Do I understand that if he were going to follow the

vein as marked on that model that he would mark the 100 foot points?

Mr. Dickson: Yes, and then I am going to follow it with the question to give the line of connection on the top at the extreme east and extreme west.

Mr. Lindley: Of course, this question of giving the dip locally depends somewhat upon the datum and the plane upon which it is drawn. If the witness can understand the question and can accomplish what the Judge wants, I hope he will do so.

The Court: My understanding is that he wants him to distinguish at points 100 feet apart the difference between the two veins, if there were two, as in this model.

Mr. Lindley: No, he is eliminating the idea of two veins altogether.

663 We start in with the idea that there is not any other *other* vein, except the vein that dips to the south. Therefore, he must necessarily assume that there is exposed two terminal edges. Must assume that there is an exposure of two terminal edges. Otherwise we have no date to work from, if you consider that that is all the vein that is cut——

Mr. Dickson: I do not agree with Mr. Lindl*ye* as to the necessity of a terminal edge at all on the law of the case. What I want him to do, Mr. Lindley, if it — going to take too much time I won't insist upon it.

Mr. Lindley: I would like to have him do it, but I simply want to know if that is your conception, that there must be two terminal edges.

Mr. Dickson: I think that is not the dip of any vein. I understand that. According to our contention it would be the dip of the south dipping vein where it intersected and joined with the north dipping vein.

Mr. Lindley: Now, eliminating for the purpose of avoiding confusion the north dipping vein. Just take your hypothesis which gives the terminal edge in that direction. Whether it is the top or not depends on circumstances, but you then have that condition, two terminal edges, isn't that correct?

Mr. Dickson: Well no. We have two terminal edges we claim, but my contention is, and will be, when we come to that branch of the case that it is not necessary to have a terminal edge of a vein defined at its top under all circumstances.

664 Mr. Lindley: With the explanation that has been made, or the lack of explanation by both Counsel, I imagine by this time that the witness can proceed.

The Court: We will take the recess at this time. The case is continued for fifteen minutes.

(At this time a recess of 15 minutes was taken.)

665 After Recess.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated mining company.

JOHN W. FINCH.

Cross-examination.

Mr. Dickson:

Q. Do you recall what my request was Mr. Finch?

A. Before I proceed with that will you permit me to change a distance which I gave you on the map.

Q. Certainly.

A. I mistook this map because we are so in the habit of using a forty scale, I used the wrong side of the scale. The question related to ore development on the five hundred level.

Q. Yes.

A. About in round numbers 350 feet, is the length of the fifth level of the westerly ore body,—the length of the easterly ore body is about 650 feet I stated.

Q. All right, that the total distance that that level is drifted in the vein is correct as you gave it?

A. About 1,150 feet, yes.

Q. You may proceed, Mr. Finch.

A. As I understand your question you wish me to assume that the southerly part of this vein ends along a certain line which I have spoken of as the crest.

Q. What I want you to do is just as though you were going to drive a raise up, following the vein up to find its true top locally; you would follow up on the true local dip, until you came to what you regarded as the top of it; that is what I want you to do and fix it on the model so far as you can. Not especially for this court but more for
666 the appellate court, if it should be carried there.

A. I cannot do that without assuming that that vein which I believe to be continuous is not continuous.

Q. I have asked you to assume that and fix on the model, and mention the places within a hundred feet of where you find it, the top of the south dipping vein, *in* that were the only vein, or if it were not a separate and distinct vein.

Mr. Lindley: Without regard to the side or end lines of the claim?

Mr. Dickson: Yes, but within the end line.

Mr. Lindley: Without regard to either side or end lines. Of course, the end lines of a claim do not have to be on its true dip, and the angle at which it cuts a vein is entirely immaterial.

Mr. Dickson: Regardless of that; the true local dip. The question seemed to be plain enough.

A. And regardless of the dip as I understand it?

Q. Yes, you regard the dip as being to the east; I understand that. The question is asked you that you assume that there is but one vein, and that the south dipping vein, or if there be any other vein it is entirely a separate and distinct vein from the south dipping vein, and the dip of which is generally southerly. I want you to start at or near the east end and travel westerly, and at intervals of one hundred feet affix on the model, where under those essentials the top of the south dipping vein would be found.

A. I will have to get you to fix for me the top where it would be found. I cannot do that.

Q. Why not?

A. Because you did not reach a top, but you get up to a top where it is horizontal and in your stopes on the exhibits
667 colored red and yellow.

Q. Go to our model where the two veins, as we contend, and the one vein as you contend, is shown in its separate colors?

A. I can run up to the point where you say that one vein ends and the other begins. At the exact end line of the claim to follow up on the local dip of the claim, you go from the south sideline in a direction almost due north, at that point.

Q. Fix the point where the top is, treating that as a separate vein.

A. I am assuming your hypothetical question. You pass up 569 raise, up to a certain point in the red representation where the quartz turned flat and then you pass flat over to your yellow line of demarcation in a northerly direction. The next hundred feet would be almost identical in a general direction,—if that is what you want.

Q. I want the top, upon the assumption embodied in the question, going up on the true local dip.

Mr. Lindley: Well, it seems to me that 'true and local dip' is a confusion of the term. The true dip is always at right angles to the strike, which cannot be a true dip and local dip at the same time.

Mr. Dickson: I think that if the vein changed in dip it changed in strike. If we have local changes in the strike we have local changes in the true dip.

Mr. Lindley: Well, your top there plunging line and not a horizontal line, from which the dip and strike is calculated.

Mr. Dickson: I do not see how the witness can have any difficulty.

Mr. Lindley: I don't either and I would dispose of it in about two minutes if it was me.

The Witness: If you can suggest,—there are so many
668 hypothetical matters in it that it bothers me.

Mr. Dickson:

Q. Well all that you have to assume, all the assumptions that you have to make are one or two,—that if the south dipping vein is the only vein, or if there be another, the north dipping vein it is a separate and distinct vein from the south dipping vein. Now, with that assumption follow up from the true local dip at intervals of one hundred feet, and tell the court where the top of that south dipping vein is found?

A. Well, Judge Lindley, I don't see how that is easy because I cannot fix the point that he is asking for.

Mr. Lindley: Well, instead of taking the hypothetical question that the Judge is asking, I am taking what is going through his mind.

Mr. Dickson: What is that remark?

Mr. Lindley: My deductions are made from what you want the

witness to testify to, rather than what is gleaned from the hypothetical question, and in that respect I made the remark and that is all, Judge. I did not intend any disrespect at all.

Mr. Dickson: Well, I did not hear the remark but I saw a broad smile go around and I just wanted to enjoy the joke.

The Court: He said that he was telling what was going through your mind.

Mr. Lindley: If you cannot answer the question with that hypothesis, all you have to do is say so, and if you can answer it do so, Mr. Finch.

A. The question involves my answering where the top of
669 that vein would be, now I cannot find any feature which indicates the top of that vein, where it passes over that roll. I can take a definite and arbitrary point, which is practically the summit of the roll, if that would be satisfactory—and a raise to be driven at the end line in practically a northerly direction, and would follow in that direction practically on the dip of the vein, up to a point where the dip changes towards the north, which is approximately the point shown between the red and yellow coloring upon Defendant's Exhibit. 100 feet further west——

Q. I would sooner you would go to our model and fix the point.

A. I cannot fix the point.

Q. Go to the point where you found the highest southerly dipping ore, can you do that?

A. Yes.

Q. Do that please. Go to our model.

A. It takes a plan map to fix the location at hundred foot intervals. There are no cross section co-ordinate lines on this model.

Mr. Lindley: There are cross sections on ours, perpendicular to that line, at hundred foot intervals.

Mr. Alling: There are on our model, too.

A. Passing upward from the south side line, about one hundred feet west of it, a raise would be driven also in a northerly direction upon the dip of the vein up to the highest point.

Mr. Dickson:

Q. On southerly dipping ore?

A. Somewhere in the top of 573 raise, at the point where that raise as a working bends over. I have got to get a plan map of some kind.

Mr. Lindley: Well, I misunderstood you- question Judge, I thought that you called for the highest point in the south dipping
vein, and that must be away up in the MacNamara end, in-
670 side of the east end. I understood you to ask the witness to go to the highest point where the ore was.

Mr. Dickson: I meant the highest point on what we call the top, not what you call the top.

Mr. Lindley: The highest point in a given section.

Mr. Dickson: Yes, at intervals of one hundred feet. I mean a vein with an easterly and westerly dip.

A. A raise driven to come up to the top of the south dipping vein, 300 feet west of the east end line, would reach the top part, about at

the bottom of 6-A raise; its direction however would differ slightly from the direction of the last two raises and would be in a northwesterly direction.

Q. That is true to a turn in the dip?

A. Yes, a local change in the dip. A raise driven to go up 100 feet further west, would start on the southerly dip and turn in a curve.

Q. Where would the top of the south dipping ore be found?

A. I had not finished that. Would turn in a curve to a direction almost due northwest, and would go up in the vicinity of raise 478.

Q. Fix it as definitely as you can, if you please?

A. Yes; about 500 feet from the end line; such a raise would have almost a due northwest direction of dip and would come up at about raise 477.

Q. Point that out. Here you will find the top of the southerly dipping ore?

A. Yes. Where it would stop dipping to the south. 600 feet from the east end line the dip would also be from the south side line upwards for approximately, to the 400 level, would be in a northwesterly direction, and then latterly it turns a little more towards the north, and would reach the point where the dip would
671 cease to be a south dip,—just an uncertain distance north of 473 raise.

Q. Where is 473 raise?

A. (Indicating.) Somewhere between 473 raise and,——

Q. It is not developed there?

A. It is not developed there.

Q. Take the next one.

A. 700 feet from the east end line would be not far from the,—a line not far from the Corkhill shaft, a north and south line, but in driving up on the dip you first start in a northwesterly direction and then continue in an almost due northwesterly direction up to an undeveloped point lying under the two hundred cross cut, or for some distance in the direction of the dip, would take it up right in here.

Q. Immediately above——

A. It would reach the highest line in such a cross section, somewhere just a little south of 367 raise in the MacNamara, it looks like. 800 feet west would go up on a northwesterly dip, and would go up also into an undeveloped point. 900 feet west, it would go up on a similar dip and come to the summit somewhere in the region of 203 Raise. The summit is not definitely developed there. 1000 feet from the east end line the dip would be a curved line, as in all these cases, having a general direction downward on the south slope, northwest and would reach the summit under the——

Q. Reach the top of the south dipping ore?

A. No; it would reach the highest point, the vein dip south, under the level marked 104, not exactly developed. 1100 feet from the east end line, which would be somewhere in the region of your section D, the dip would also be in a northwest direction, and would pass up to the line between the yellow and red in the old MacNamara stope.

Q. In the vicinity of raise-A?

672 A. Yes. 1200 feet is about the last raise that could be driven. That would come up in the westerly end of the summit of the old MacNamara stope and would be driven upward in a curving northwesterly direction.

Q. Well, where would you come to the end of the south dipping ore—whereabouts?

A. About where you have shown your line between the yellow and red, changing from one dip to the other.

Q. Taking a line—connecting these points where you found, or say would be found the top of the southerly dipping ore, approximately what would be the course of that line to your terminal edge,—at westerly termination of the ore? Pretty nearly at right angles wouldn't it?

A. It would be a curving line sloping downward in an east direction, and not at right angles with the entire edge of the vein shown in this small model.

Q. Take a line connecting the most easterly and most westerly work where you find the top of the south dipping ore, what would be the course of such a line with reference to the course of the westerly terminal edge that you have spoken of?

The Court: The terminal edge has two direction-, one on the south side and one on the north.

Mr. Dickson: Yes, but he gave the average course as north, 5 degrees east, I think.

The Witness: No it was local. That was only for a limited section of it.

Mr. Dickson:

Q. Well, what is the course of your terminal edge, the average course?

A. Take it clear across the map here, and it is——

673 Q. What is the course of the strike of this vein as you claim it to be? Put it that way.

A. I will have to determine that. About north seventeen or eighteen west.

Q. What is the course of the strike as you term it?

A. That is the course of the outcrop in that area.

Q. What is the course of the strike of your vein or veins, which you say has a northerly and southerly strike?

A. That can be very well shown by taking two extreme points on a level, as on the 300 West End level, which it goes clear across. It is about north thirty west.

Q. Didn't you give the course 5 east?

A. Yes, that was for a part of it.

Q. For a part of the strike?

A. Yes.

Q. Now what is the course of the line connecting the most easterly and most westerly places, where you found the top of the south dipping ore?

A. About north eighty-two west.

Q. No veins are regular either in their course or dip, that you ever saw, are they?

A. Not absolutely regular.

674 Q. Most of them are very irregular both in course and dip from point to point?

A. That is particularly characteristic of contact veins.

Q. Well, most veins, whether they are contact veins or veins of impregnation, or bedded veins or fissure veins, generally speaking, they vary considerably, both in course and dip from place to place, isn't that true?

A. Well, yes, there is a very wide difference between them. For instance, such veins as the Smuggler, Mendota vein in the San Juan Mountains.

Q. Speaking generally, there is a very marked——

A. That is a straight vein; extends two or three miles. That vein does not change very much, but it is somewhat exceptional.

Q. I say, speaking generally of veins, isn't that true?

A. They are not absolute planes in any case.

Q. I did not use the word *word* "planes." I say speaking generally of veins, v-e-i-n-s.

A. Yes, I understand you.

Q. Are there irregularities both in course and dip?

A. There are in a great many cases.

Q. And in most cases that is true, isn't it? Did you ever see a vein that pursued a straight line from end to end on its course, and had an unvarying dip from top to bottom, in your life?

A. Oh, with small local variations, I have seen some veins with remarkable regularity; the Brum Lummon vein.

Q. You are speaking of some vein that is specially regular?

A. Yes.

Q. I am speaking of veins generally, not taking special cases, is it not true that they vary considerably, quite widely from place to place, both in dip and in strike?

A. They very often do.

675 Q. That is what I want.

Mr. Lindley: You asked him if he ever saw one that ran straight and he is telling you about it, Judge.

Mr. Dickson:

Q. Is it anything unusual at all, when you go downward on the dip of the vein to find irregularities in the dip, swells, bulges, in any vein?

A. No, pinching and swelling and local changes of dip and strike are quite characteristic.

Q. You find them going down,——

A. In veins of most types.

Q. You can find the same vein at places going down at its dip at varying angles almost from the horizontal to the perpendicular can't you?

A. Certain classes of veins, yes.

Q. And with swells in the vein?

A. Yes.

Q. Undulations, folded out owing to the increased thickness of the ore?

A. Yes.

Q. To what extent from your observation, if at all, has the vein or veins that we are dealing with replaced the country rock, mineralized it, by the process of replacement?

A. By far the greater part of the quartz in the vein is formed by that process.

Q. Well, to what extent from the fissure or fissures which you take to be the channels of circulation to the solutions has the country rock been replaced by the solutions and converted into ore or unmistakable vein matter?

A. Most of the unmistakable vein matter is formed in that way, but, if you will permit me to indicate what I mean in the
676 corner of Finch Exhibit 1; The fractured zone forming the fissure shows some of the angular fragments of the trachyte which were replaced by the silica. Now those——

Q. Well, we will talk about those later. Speak about your main vein.

A. I am talking about the vein as a whole and about the unmistakable ore in the vein. We find in the ore traces of the outline of the trachyte rock which was replaced and has been changed entirely into quartz. So far as I have represented for the benefit of the Judge the fragments of the country rock which have been now entirely changed to quartz, that was replacement. But, in the interstices, or cavities, between these little fragments of rock, another type of quartz was deposited which filled openings in the unmistakable, as you say, the commercial part of the vein, even there by far the greater part of it was replacement of the trachyte.

Q. My question was how far from the channel of circulation, the fissures, has this process of displacement extended, the greatest distances, how many feet?

Mr. Lindley: Well, this is the first time you have asked that question, Judge. Did you ask it before?

Mr. Dickson: I think I did.

Mr. Lindley: I beg your pardon. Go ahead.

Mr. Dickson:

Q. Into the foot-wall country, for instance, how far from the line of fissuring?

A. Extends out, oh, 40 or 50 feet in places. Extends out a very short distance in other places, especially in this middle section where no stoping is seen on the model there is much less extension of silicification.

Q. That was made out to a very considerable extent near
677 the crest of this fold, between the hanging-wall of the north dipping branch and the hanging-wall of the south dipping branch of your anticlinal fold, the intervening country has been replaced by the solutions that flowed through these channels of circulation, has it not?

A. Well, I am not sure of that. The development up around the crest of the anticline——

Q. I mean the works immediately below the crest that you have been into.

A. I am attempting to answer your question, sir. In that region the development is so thorough, there are so many openings that a great amount of this replacement of the country rock is seen. At other points where there is similar development, it is also seen. There are other regions, for instance as those which I indicate to the southwest of the West End shaft——

Mr. Lindley:

Q. On "Finch 5"?

A. Yes. Where on horizontal plane there is 150 feet of width of very nearly solid quartz, and a certain amount of replacement extending still further.

Mr. Dickson:

Q. You could have answered much more briefly if you knew what I was trying to get at. Would not the extent of replacement here indicate that this rock underlying the hanging wall of the north dipping, and the hanging-wall of the south dipping sides, or branches of your anticlinal fold, especially at the crest of that fold, and for some distance vertically or beneath it, indicate that that rock must have been quite soluble in order that it could have been so attacked and so replaced?

A. No, it indicates more than that. It indicates——

Q. Well, solubility must be one element that enters into it?

A. Yes, but just as important as that is the proper fracturing and crushing up in the process of fissuring so that the solutions can attack it.

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Q. The greater the amount of fracture, therefore, the greater access for the circulation of the solutions, and that would be one element?

A. Yes.

Q. And another element, of course, would be the degree of solubility of the rock?

A. Yes.

Q. Those two together?

A. This rock is the lode porphyry of the district and is favorable to replacement of that kind.

Q. Owing to the solubility of the rock as one factor?

A. Yes, especially on the hanging-wall side.

Q. Are there any places where you have followed up on the south dipping vein, or the vein where the quartz dips to the south, where you have come to an abrupt change, as cut off by a knife-blade from the south dipping structure to the north dipping structure? Not a gradual bending over, but an abrupt change.

A. Yes, I find that condition in many points in the mine.

Q. At the point of junction of the south dipping and north dipping branches?

A. Yes, we find that sort of fractures there, and you also do not find them.

Q. And you find it where there are no fractures, an abrupt change, don't you, from the south dip to the north dip?

A. No.

Q. Let me call your attention to some particular points: In raise 569, 20 feet below the hanging-wall of the north vein, or
679 twenty feet under it, don't you—not downward, under,—don't you find there an abrupt change from the south dip to a north dip?

A. Oh! You find an abrupt change from the dip of the vein to the dip of the——

Q. The dip of the material in the vein, the quartz.

A. Yes, and the dip of the little intersecting fracture, then the dip of the vein goes on.

Q. Is there a fracture there that accounts for the change in the dip?

A. There isn't any real change in the dip. It is about horizontal at that point.

Q. Wait a moment: I am not going to waste time on that. Then, I understand you to say that, as you go up raise 569 to a point 20 feet below the hanging-wall of the north vein, there is no abrupt change in dip such as I have——

A. Only in a very local way.

Q. What?

A. Only in a very local way.

Q. Well, is there any?

A. The same sort of rolls and patches that are in the vein at other points, there is that change. The sketch shows it marked "Finch C."

Q. At raise 571, 20 feet below the 400-level, do you not have an abrupt change from the south dip to a north dip?

A. No.

Q. You do not?

A. Except a little undulation at two or three points.

Q. Do you find it there, or not, where the south dip stops and changes abruptly to a north dip, and from that on have nothing but the north dip?

680 A. Raise 571 goes over in a very smooth arch in a general way, and in an accurate way it shows the change of dip.

Q. There is no abrupt change at that point?

A. Except for little turns here and there, a foot or two or three feet in the dip.

Q. And is there, or not, an abrupt change in dip at the place I have called your attention to?

A. Nothing special at that point.

Q. In raise 4A, where the 3a raise connects with the stopes on the south vein, that would be the bottom of the raise, have you not there an abrupt change in dip from a southerly to a northerly dip?

A. No. I will state the reason why.

Q. Well, no; if it is not there that is all I care about.

Mr. Lindley: He has got a right to state his reasons.

A. The vein is two streaks entirely, two streaks that have been mined. The upper one runs as shown upon Sections 3 and 4 which

are in that region, runs up and curves over very sharply. The lower one curves over in a very flat and regular way. The average of the vein would be a line drawn through the middle of the vein, and such a line would not show any abruptness in dip.

Mr. Dickson:

Q. Are you paying attention to the particular point that I invited your attention to?

A. This is very near at hand.

Q. Raise 4A, where that raise at its bottom connects with the stopes in the south vein?

A. I understand precisely where you mean, and I have illustrated the conditions that exist there.

Q. And you say there is no abrupt change in the dip there?

A. No, not on the center of the vein.

681 Q. Raise 5A, 1 foot below the hanging-wall of the north vein and over the stopes on the south vein, have you not an abrupt change in the dip?

A. 5A?

Q. Yes.

A. It is about the same as it is here.

Q. What?

A. About the same situation that is shown in this cross-section.

Q. That means that there is no abrupt change observable there by any man?

A. Not as I interpret it.

Q. Is the Fraction dasite breccia faulted by the Siebert fault?

A. Yes sir.

Q. Can you point out some places? Fix them definitely.

A. Raise 152, which is the raise that passes upward into the 136 level of the Porcupine shaft.

Q. That is raise 152 on the maps of both parties?

A. I think so.

Q. Some other one place.

The Court: It is now half-past four.

Mr. Dickson: I can finish in a few minutes, if your Honor please, I think.

Q. Do you find any places where the Fraction dasite breccia cuts into and across what we call the south dipping vein?

A. Yes.

Q. You do find it cutting into it?

A. Well, resting upon the end of the vein.

Q. Do you find it cutting into it?

A. Well, that, we can hardly speak of that breccia as cutting into anything.

682 Q. Well, you could understand if that is what you call the Fraction dasite breccia, if there was an upthrust there, carried that material up from below, that it would cut the country, wouldn't it,—cut through the vein, cut into the veins? Now, what I want to know is in that sense if there is any place where you find what we call the Fraction dasite breccia cutting into the south dipping vein?

A. No, I do not find any such thing.

Q. You say there is no such place?

A. No, I haven't seen any such place. You find the edge of the vein there very much as the edge of the other vein.

Q. I am not speaking of the edge.

A. I do not know what you mean.

Q. You do not know what I mean?

A. I have not seen any such place, where the Fraction dacite breccia cuts anything. It rests upon the underlying rocks.

Q. Do you think that this Fraction dacite breccia was deposited where it now is by a flow, or that there was an eruption there?

A. Both.

Q. Both?

A. Yes. There are some layers in it that seem to have flowed in the form of mud.

Q. So that along its terminal edge you have evidences of an eruption?

A. Oh, no.

Q. That is what I am speaking of.

A. No evidence; a great deal of evidence to the contrary.

Q. Then, according to your observation, all the evidence is that the Fraction dacite breccia found along this terminal edge that you have spoken of has flowed there?

683 A. Has either flowed there, or settled down there from an unknown source from a distance.

Q. And was not the result of an eruption in that vicinity?

A. No; not any known point in this vicinity. What I mean by that is that the nature, the surface of the Fraction dacite breccia shows no evidences of having been thrown up through the other rocks. It shows a great deal of evidence to the contrary.

Q. Do you know what was spoken of by our witnesses as the Brougher Mountain dacite?

A. Yes, I have been up——

Q. Is that the same as what you call the Fraction dacite breccia?

A. No.

Q. What is the difference? Where was one found, and where the other?

A. That is a much solider rock. This little house that stands at the entrance of the courthouse is made of Brougher dacite; rather firm, solid rock.

Q. How does that differ from what you call the Fraction dacite breccia?

A. Quite loose rock.

Q. What?

A. The Fraction dacite breccia is quite a loose rock.

Q. And the other?

A. And the other is quite a firm, solid, compact rock.

Mr. Dickson: Well, there will be a few more questions.

The Court: The case is continued until tomorrow morning at 10 o'clock.

[End of Volume I.]